MOTOR AGE

Vol. XXIX
No. 8

CHICAGO, FEBRUARY 24, 1916

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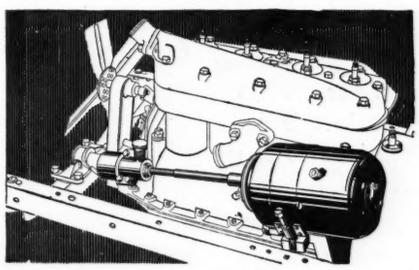
Three dollars a year



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Trade Mark

On account of the sharp advance in the cost of raw materials the price of the 1916 Shaft Drive Genemotor is now $85.00

Built by General Electric Company

A. J. PICARD & COMPANY

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80% Less Friction

Almost Doubles the Endurance of the

HUDSON SUPER SIX TRADE NAME REG.

$1375
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Patented by Hudson
December 28, 1915
Patent No. 1165861

Hudson Super-Six

A Small, Light Six Delivers 76 Horsepower

THE Super-Six motor has a cylinder capacity of 288 cubic inches.

This size develops some 85 horsepower. But heretofore, at its best, it delivered 42 horsepower. Some 50 per cent was lost in vibration and friction.

The Super-Six delivers 76 horsepower. In this patented motor only 10 per cent is lost in vibration. Thus friction loss is reduced 80 per cent. And that gives to the motor almost double endurance.

JUST WASTED POWER

This extra 34 horsepower is simply power that heretofore was wasted. We have added no cylinders or size. We have not increased fuel consumption.

All the advantage of the Super-Six lies in its utter smoothness. It shows in bird-like motion. The motor is small and light—same size as the Hudson Six-40. It is very economical because of the saving in friction. Rarely does this motor run at more than half load. And the engine wear is almost eliminated.

NOW SUPREME

It must be conceded that the Super-Six motor makes the Hudson car supreme. It has broken all stock car records.

No other type—Six, Eight or Twelve—can approach the Super-Six in performance.

You can prove this by one ride. The Super-Six feats will amaze you. You never saw such effortless performance, such flexibility, such quick response.

No man can doubt that the Super-Six is the greatest motor built. And the luxurious bodies on this new Hudson make the car look its supremacy.

A BASIC PATENT

Note that the Super-Six is controlled by a basic patent. There is nothing else like it. Any man who wants this reserve power, this smoothness, this endurance, must buy a Hudson to get them.

And men will want them. If you don't think so, try a ride in the Super-Six.

7-Passenger Phaeton, $1375 at Detroit.

Five Other Styles of Bodies.

HUDSON MOTOR CAR COMPANY
Detroit, Michigan

World's Record Breaker

All Records up to 100 Miles

These tests were made at Sheepshead Bay with a 7-passenger Super-Six—a touring stock car—under official supervision of American Automobile Association.

100 miles in 80 min., 21.4 sec., averaging ***74.67 miles per hour,*** with driver and passenger.

75.69 miles in one hour with driver and passenger.

Two laps made at 76.75 miles per hour.

Standing start to 50 miles per hour in 16.2 sec. A new record in quick acceleration.

MOTOR AGE

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—NEXT WEEK—

The feature of next week's Motor Age will be a report on the Louisville, Ky., show, with a resume of trade conditions in the South, together with a report on the Boston show.

$100 to Boy Drivers

THERE are many boys that drive the family car while father sits beside them, leaving the handling of the car to the boy's judgment. Numerous interesting experiences must have developed, in which the boys have been the central figures. It is with the thought of passing these experiences on to others that Motor Age is offering prizes for the best stories or articles submitted and accepted for publication in Motor Age's annual touring number, which this year will bear date of May 18.

This offer is open to every American boy 17 years of age or less and may touch upon long treks taken in cross-country touring, or short journeys for the week end. The novel experience is wanted rather than the commonplace. For the best acceptable manuscript of 1,000 words or less, accompanied by photographs for illustration, received up to March 20, 1916, Motor Age will pay

$50

For the second best manuscript of the same approximate length and accompanied by photographs

$25

A third prize of $15 and a fourth of $10 will be given for manuscripts accepted under the same conditions as those mentioned above.

All manuscripts and photographs either will be returned or, if used, will be paid for at space rates.

Address Boy Driver Contest Editor, Motor Age, 910 Michigan Ave., Chicago.

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THE fact that Studebaker Dealers have what is perhaps the FASTEST-selling line of cars on the market is only one of the reasons for their unusual success. But it is a BIG reason—and no man entering the motor industry can overlook a line that so thoroughly dominates the market as Studebaker does with the new SERIES 17 cars—a 40 h.p. Four at $845 and a 50 h.p. Six at $1050. Write for more of the details on this Studebaker line—and Studebaker opportunity.

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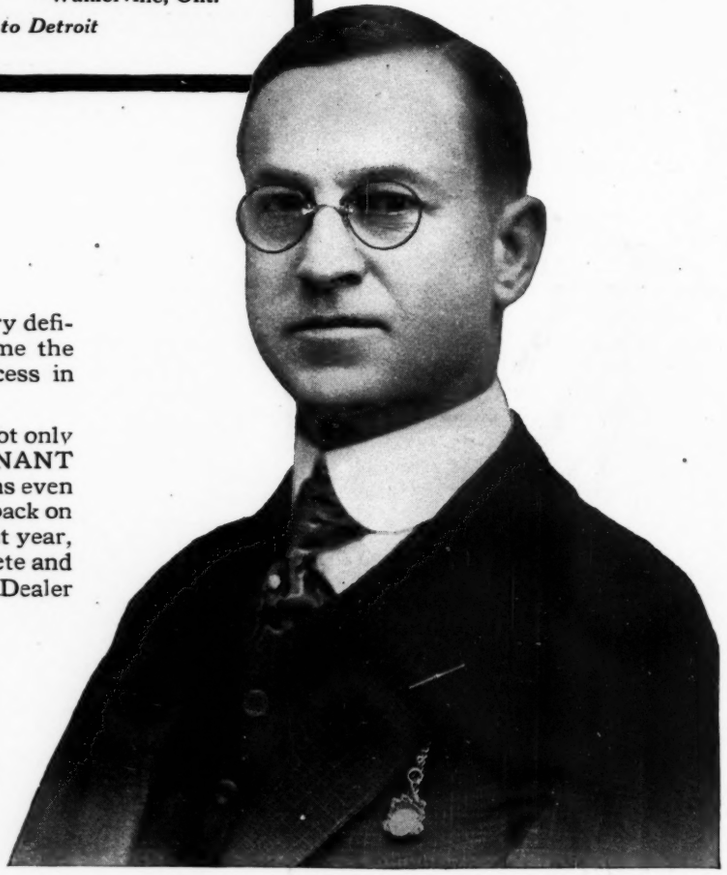
Studebaker gives me a line of cars not only COMPLETE but easily the DOMINANT values of the market. And what seems even more important to me when I look back on the competitive conditions of this past year, Studebaker gives me the most complete and powerful sales co-operation that a Dealer can wish for.

J. Gray Coburn

Coburn Motor Car Company
Norfolk, Va.



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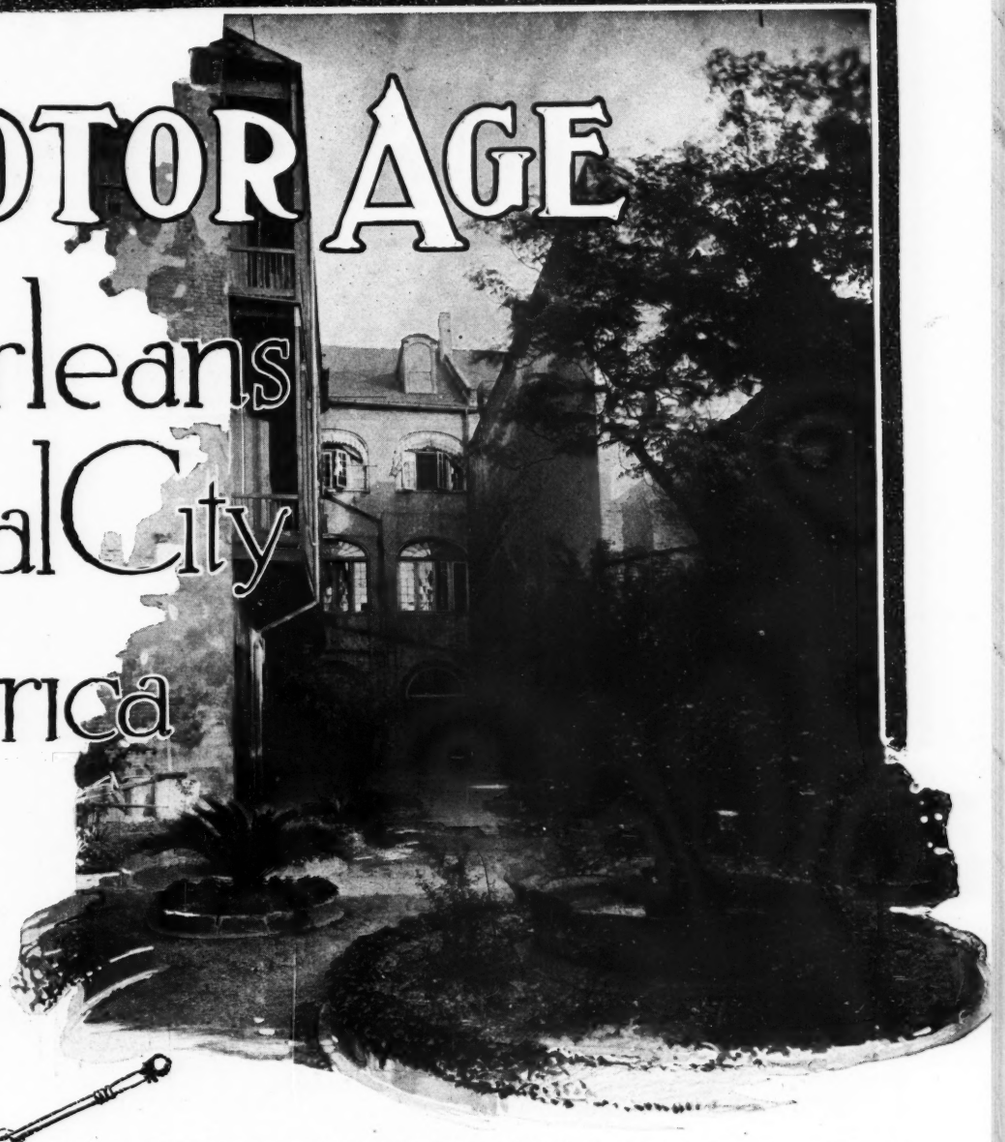
MOTOR AGE

New Orleans The Carnival City of America



Typical New Orleans court yard and old dwelling, built in 1815 and once the home of Paul Morphy, the noted chess player

By Mills Evans

ONE hundred and ninety-eight years ago, a French colony was established on the Mississippi river, 107 miles north of the mouth of that majestic and temperamental stream, under the direction of an ambitious adventurer, Bienville, and with the consent of an equally ambitious old world power.

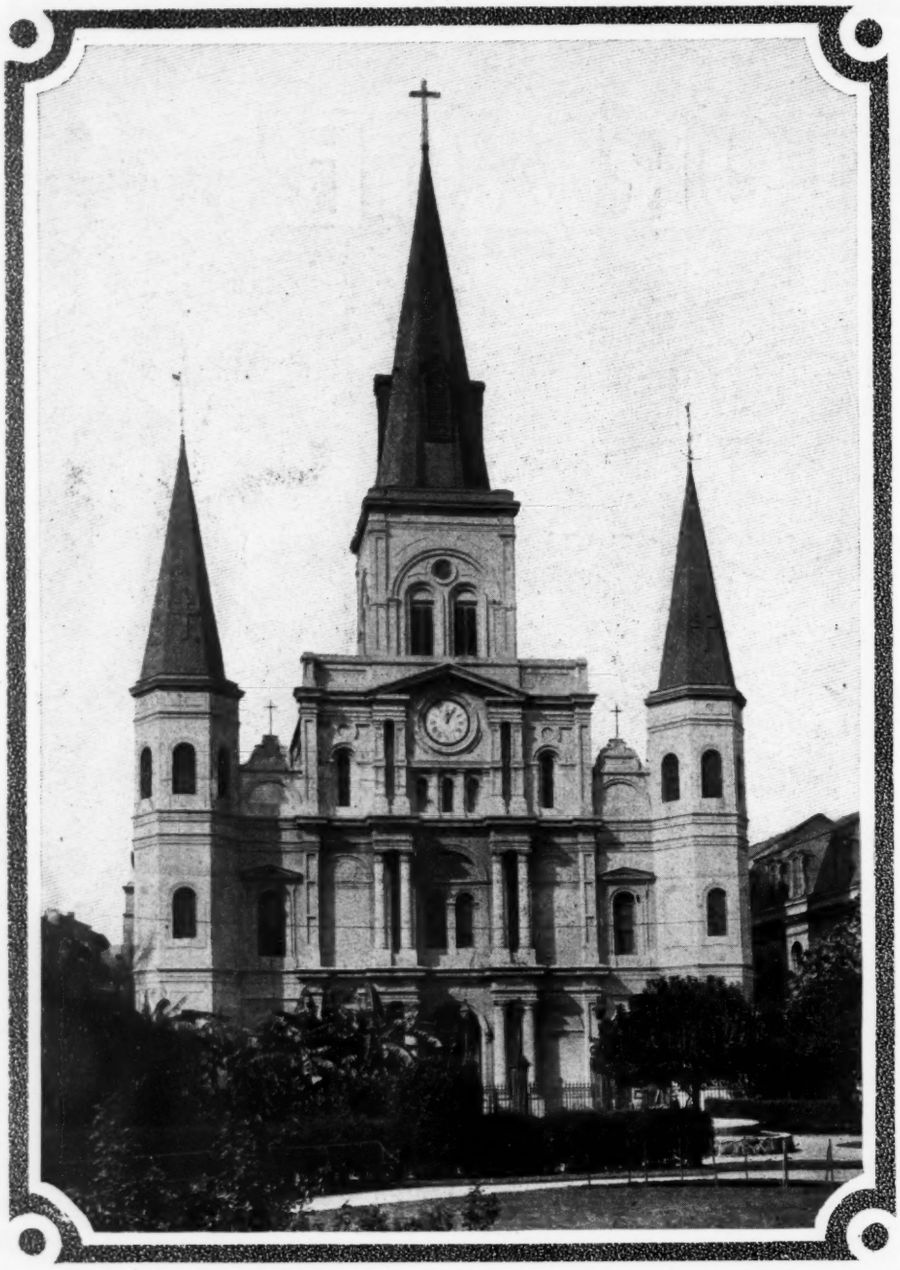
Named in honor of the French regent, Duc d'Orleans, that colony, to which settlers from France and Canada flocked in the spirit of romance and adventure, was destined to be the carnival city of America by the joyous mood of her earliest inhabitants and the charms with which Nature endowed her.

New Orleans was born with a laugh in her throat and jangling the bells of Pierrette, as Marblehead was born with anxious eyes to watch for the return of her men that go out to sea, as Milwaukee was born with a "Prosit" on her lips and a stein of good health in her hand.

Each year, the happy city of Bienville invites the world to laugh and make merry with her. Just before Lent, she dances about in the spangled dress of Columbine before putting on the sackcloth of repentance. A municipality of beauty and romance, she now is primping before the glass of anticipation, putting a beauty patch here and a touch of rouge there to charm the thousands of pleasure-seekers who are traveling southward as the season of Mardi Gras approaches.

The citizens of New Orleans, connoisseurs in the art of entertaining, have in Nature a willing aid in preparing for their guests. With lavish hand, Nature has bestowed her gifts on the winter capital of the south, on the Nice of America. History and romance have worked equally as hard, with the result that there is little left for the host to do beyond throwing wide the doors of hospitality and welcome, already set ajar.

Lying practically on the gulf coast,



The St. Louis' cathedral, in the back of which is a plot of ground where numberless duels were fought in the brave days of old

between Lake Pontchartrain and the Mississippi river, surrounded by parks and resorts, and fanned by the warm zephyrs from the Gulf of Mexico, the city throws off the chill of winter almost with the passing of the old year and flower bedecked and verdant, welcomes the tourist who knocks at her gates to join with her in bending a knee to the jolly king whose frolicsome reign covers a period of 36 hours and starts this year on March 6.

A Province of Fairyland

From the banks of her crescent-shaped harbor to the shores of Lake Pontchartrain, New Orleans in March is a thing of beauty. City park, covering more than 216 acres; Audubon Park, only a trifle smaller; the countless minor parks and squares with which the city is provided, its picturesque and beautiful cemeteries, its wide and tree-lined streets, form so tempting a picture that the stranger, who only a few hours before, turned his back on his snow-shrouded northland, thinks he has been transported to some bit of fairyland and can scarcely believe the testimony of his vision.

Nor does the work of nature end here, but jutting out in all directions are natural roads, highly improved and modernized, which are a joy to the heart of every motorist. One of these will lead him to West End, a well equipped resort on Lake Pontchartrain. Another extends to historic Spanish Fort with its ancient fortifications and cannon and the Coney Island of New Orleans; still another runs to Mileburg, the family resort of New Orleans; and a fourth, a modern speedway extending 30 miles into the heart of the fishing district, will take him to Chef Menteur, the home of the red fish and the sheephead. There

are other highways of the modern and highly improved variety which extend both up and down the Mississippi river and into the heart of the pure ozone belt. Following these highways, the motorist finds on all sides verdant fields, thriving farms and warm, flower-scented breezes.

Returning to New Orleans, the visitor finds a wealth of romance and history, some pathetic, some exhilarating, all of absorbing interest. The "Vieux carre de la ville" alone is a section from whose fruitful vine Cable, Dimitry, Gayaree, and others have culled material for many of their most absorbing tales. The "vieux carre" is that section of New Orleans lying between Canal street and Esplanade avenue, Rampart street and the Mississippi river. It is the New Orleans of Don O'Reilly and Baron Carondelet, of the days of fair ladies and brave cavaliers, it is La Nouvelle Orleans as laid out by Lafour and Panger two centuries ago. The main arteries of this section are Royal and Chartres streets, the former named in compliment to the Bourbon kings.

Attractions of Royal Street

Royal street starts at Canal, the city's main thoroughfare, more than 200 feet wide, and just at this corner the visitor finds his first place of interest. Extending out Canal for a half block is a line of brick stores erected more than three-quarters of a century ago by Judah Touro, the man whose wealth made the New Orleans Touro Infirmary possible. Nearer the river on Canal street and covering a square is the granite Custom House with its famous marble hall.

Turning down Royal street a few yards is the entrance of what was formerly the office of Antommarchi, physician to Napoleon I. It is now the entrance to the Cosmopolitan hotel. Adjoining the hotel is the Gem Saloon and Restaurant, unique in its way and closely identified with the city's history. In this building in 1872 were the headquarters of the Carter wing of the radical state legislature. The metropolitan police, under General Badger, invaded the place January 10, 1872, and acting under orders of Governor Wormoth, expelled the members, giving birth to the civil strife which led to the bloody riots of the reconstruction in which sixteen citizens were shot down at the foot of Canal street. A granite shaft marks the spot where these men died to put an end to carpetbag rule in Louisiana.

Across the street is old No. 126, Royal, the Merchants Exchange. In this building for many years were located the federal courts and the United States post office. In the former William Walker, the

celebrated filibuster, was tried for violating the neutrality laws. The site of the post office is now the Sazerac saloon.

The trade rooms and slave market of the exchange were on the second floor, now an athletic club and the scene of the famous Fitzsimmons-Dempsey fistic encounter. Next door, at the corner of Royal and Iberville streets, is a handsome granite structure with Ionic columns erected in 1836 at a cost of $140,000 as the home of the Union National Bank and closed by General Ben Butler during the civil war. A billiard room now occupies this building.

Curio and Antique Shops

Extending down Royal street, from Iberville to Toulouse, are numerous curio and antique shops, all worthy of a visit and many housed in old, quaint buildings with picturesque courtyards.

The banking center of old New Orleans was at the intersection of Royal and Conti streets and at each of the four corners was located a bank. Two of these structures still exist—the Bank of Louisiana, built in 1826 and now the mortgage and notarial office, and the Louisiana State Bank, designed and built by Robert Mills, architect of the Washington monument, in 1826. A few doors down Royal street is No. 417, at one time the home of Paul Morphy, the noted chess player. The building may be recognized by the beautiful wrought iron balcony ornamenting its front. Morphy was found dead in one of the rooms in this house in 1884.

The New Orleans courthouse, completed in 1910 at a cost of $1,090,000, is a great stone and marble structure that covers the square bounded by Royal, Conti, Chartres and St. Louis streets. A block away, at Toulouse and Bourbon streets, is the famous French Opera House, built in 1859, according to plans drafted by James Gallier. This building has been visited at various times by some of the most famous artists of the nineteenth century and is annually the scene of a number of the Carnival balls. Here Adelina Patti sang in 1861 and Jenny Lind enthralled many audiences of music-loving Orleanians about the same time.

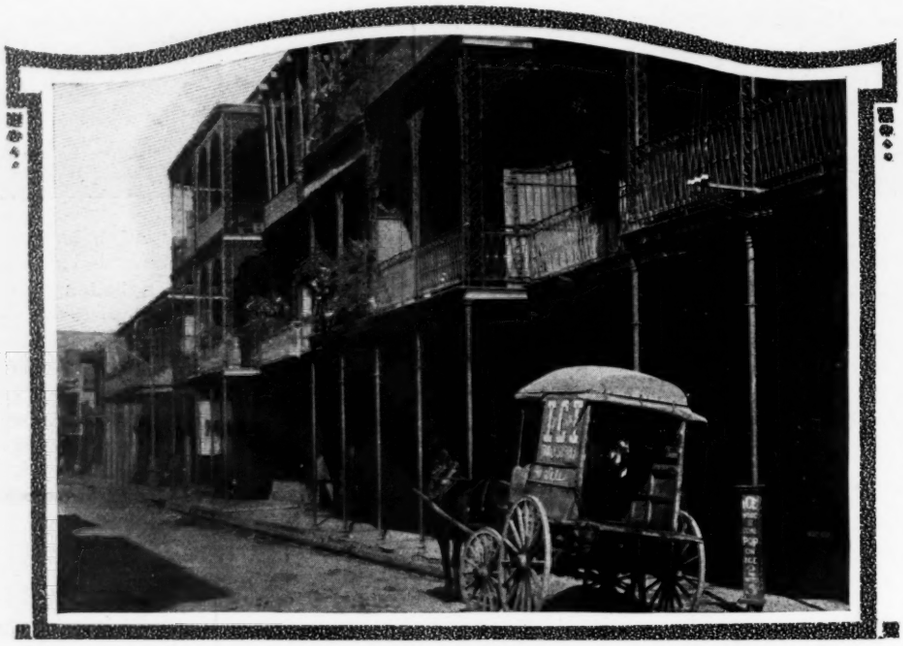
Return to Royal street and leaving the courthouse, the tourist stops before the Hotel Royal. Demolishers have just started their work on this building and though the task is expected to take several months, this carnival will see its passing. This building is closely identified with the history of New Orleans and the state of Louisiana and even has been touched by national fame, for it was here the returning board met in 1876 and tabulated the returns of the national election, which called forth congressional criticism and led to the seating of Hayes in the presidential chair.

A Celebrated Ballroom

The ball rooms of the Hotel Royal were the most celebrated in the world at that time. Great mirrors, reaching from the ceiling to the floor and their centers pierced by brackets to hold the lights, ornamented the walls. The mantles of the great fireplaces were of onyx and Italian marble and the ceiling and walls were beautifully frescoed. Here were given many noted social affairs, including a ball in honor of Henry Clay in 1843.

The rotunda, three stories high, was sup-

Rex, King of Mardi Gras, landing at Canal street and the river and escorted by his court. This is the first ceremony in the military and civic parade held on Monday of carnival week



Looking down Royal street in the "Vieux Carre." The three-story structure on the corner is the "Haunted House"

ported by great columns and its ceiling and walls were gorgeously decorated with fresco work. To the rear was the slave auction block and "trotting board" on which the negroes were paraded before prospective buyers. Further back were the heavily barred cells where the blacks were confined until sold.

The building was purchased by the state in 1872 and used as the state capitol until 1882. It was the scene of an armed attack on the part of the citizens in an attempt to bring about the resignation of Governor Kellogg in September, 1874.

No, 527 Royal, across the street from the Hotel Royal, is an archway flanked by two deeply imbedded cannon, This was the entrance to the Commanderia, or headquarters of the Spanish police. The building was erected by Gov. Miro in 1784 and its courtyard is a most interesting one.

At St. Peters and Royal streets is "Sieur George's House," described in Cable's story "Old Creole Days." It is a four-story brick building erected in 1809.

A Famous Duelling Ground

Now comes the iron-fenced gardens of St. Anthony, in the rear of St. Louis cathedral whose flower-bedecked grounds were the favorite resort of the gentleman-idlers of long ago. The little plot of ground has been the scene of countless duels, many of them fatal and of a historic character.

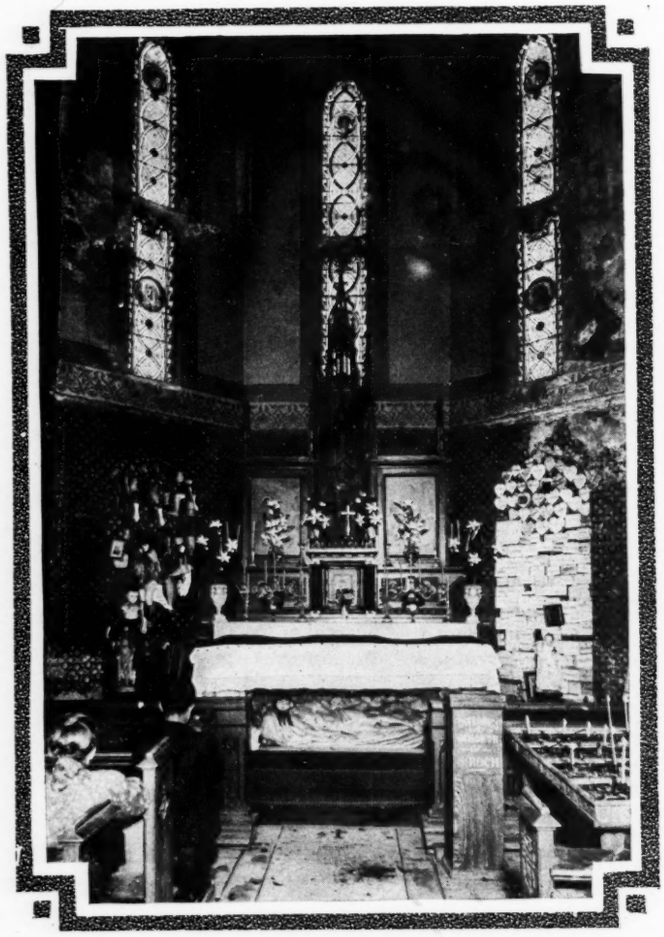
Opposite the Cathedral Gardens and in Royal and Orleans streets is the large brick building occupied by the sisters of the Holy Family, erected in 1817 by John Davies and used originally as a dance hall.

On the upper riverside corner of Dumaine and Royal is the residence of Mme. Poree on whose gallery Gayarre, the historian stood, watching the Creole women wave farewell to the soldiers who marched forth under Andrew Jackson to meet the English in 1815 just beyond the limits of the city.

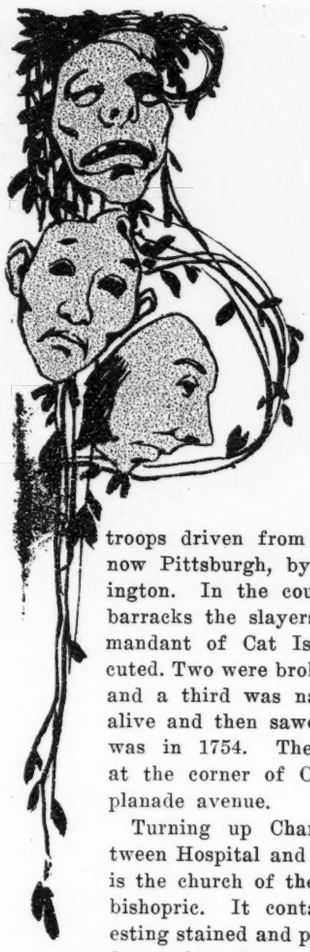
On the upper side of Dumaine street, between Royal and Chartres, stands a quaint low building with wide shadowy porches also referred to in Cable's story.

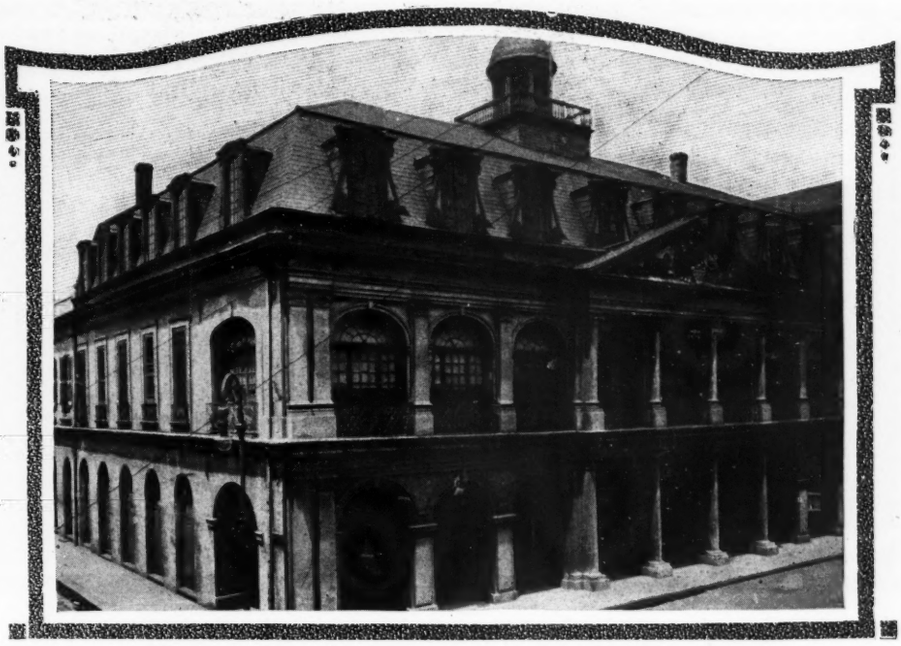
The "Haunted House" is the large three-story building on the upper riverside corner of Royal and Hospital streets. This building was occupied by M. and Madam LaLaurie, persons of culture, wealth and refinement. They entertained Lafayette during his brief sojourn in New Orleans. A fire in the attic of this building, April 10, 1834, led to the discovery of seven negroes sadly mutilated and more or less dead. An investigation developed that Mme. LaLaurie, during her leisure moments, beguiled herself with torturing her slaves. A search of the house disclosed numerous instruments of torture, including an iron collar with sharp spikes. A mob was formed and the interior of the building was wrecked, scarcely more than the walls being left standing. The couple fled to Paris. Later the building was remodeled and used in turn as a girls' school, store, residence, boarding house and saloon. The fact that little success attended those who occupied it led to the belief that it was haunted.

This carries the visitor to Esplanada street, where the elite of old New Orleans resided. Many palatial homes of the old order still ornament this thoroughfare and in one is located the palace of the Archbishop of New Orleans. Nearer the river is located the building formerly used as the United States mint and now as an assay office. In Esplanade avenue, near the river, also was located the barracks erected by Gov. Kelerec in 1738 to accommodate the



The shrine in Campo Santo, St. Roch's cemetery





The cabildo, seat of the Spanish government, now used as a state museum

troops driven from Fort Duquesne, now Pittsburgh, by General Washington. In the courtyard of these barracks the slayers of Roux, commandant of Cat Island, were executed. Two were broken on the wheel and a third was nailed in a coffin alive and then sawed in two. This was in 1754. The barracks were at the corner of Chartres and Esplanade avenue.

Turning up Chartres street, between Hospital and Ursuline streets, is the church of the St. Mary archbishopric. It contains some interesting stained and painted glass windows. One of these is a curious picture of the battle of New Orleans and recalls the fact that the nuns remained at prayer in their chapel all night the eve of the battle, praying for the success of the Americans over the British.

Palace Built in 1727

The archiepiscopal palace, used until 1896 and which adjoins the church, is the oldest building in the Mississippi valley and is in an almost perfect state of preservation. It was constructed in 1727 and for 90 years was used by the Ursuline nuns when it was leased to the state and used until 1834. It was then given to the Catholic diocese and was the home of the archbishop of New Orleans until 1899, when he moved to the palace in Esplanade street and the building became the office of the chancellor.

The stairway is made of great timbers and on the third floor are still to be seen the cells occupied by the nuns nearly 200 years ago, the desk of the superioress and the benches used by the slaves attached to the convent. In the office is a clock made by Dey in Paris in 1638.

Opposite the Archbishopric stands an old dwelling with slender Ionic columns supporting a portico. This was the home of General P. G. T. Beauregard, prior to and during the civil war and latterly has been the scene of one of the most bloody mafia murders in the history of New Orleans. Here in 1909 four Italian wine merchants were shot to death and several persons were wounded.

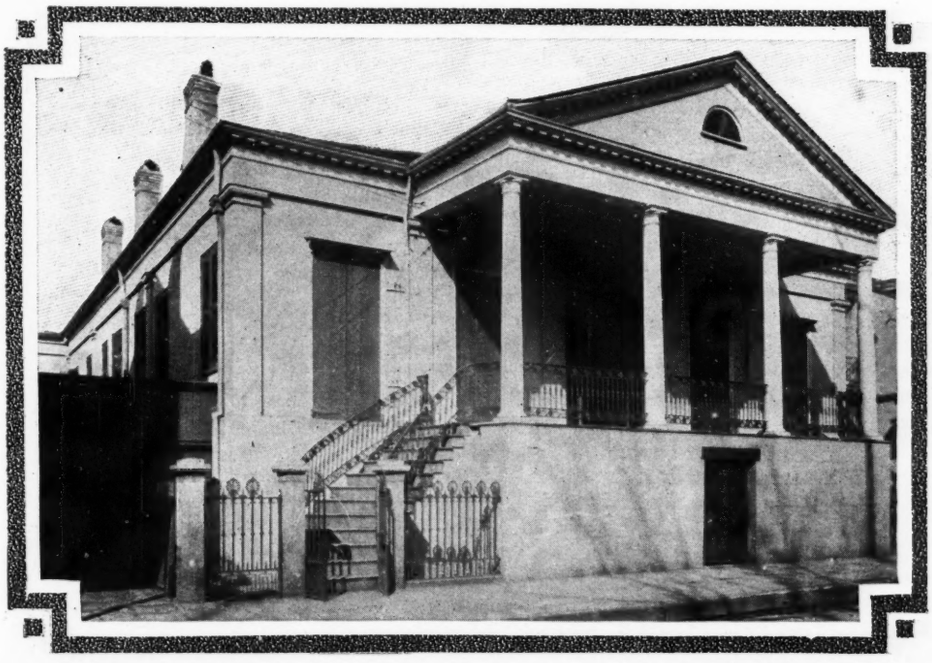
In Chartres street, between St. Philip and Dumaine streets, is located the Café des Refuges, a one-time haunt of General Humbert, noted chieftain under Napoleon, and adjoining is the Hotel de la Marines, where several score of Sicilians were butchered in 1857 during the "Know Nothing" riots in New Orleans. A long, narrow alleyway, still existing though closed to the public, gave access to this hotel from Decatur street and on account of the many Italian murders committed there became known as Vendetta Alley.

Retreat of Bold Pirates

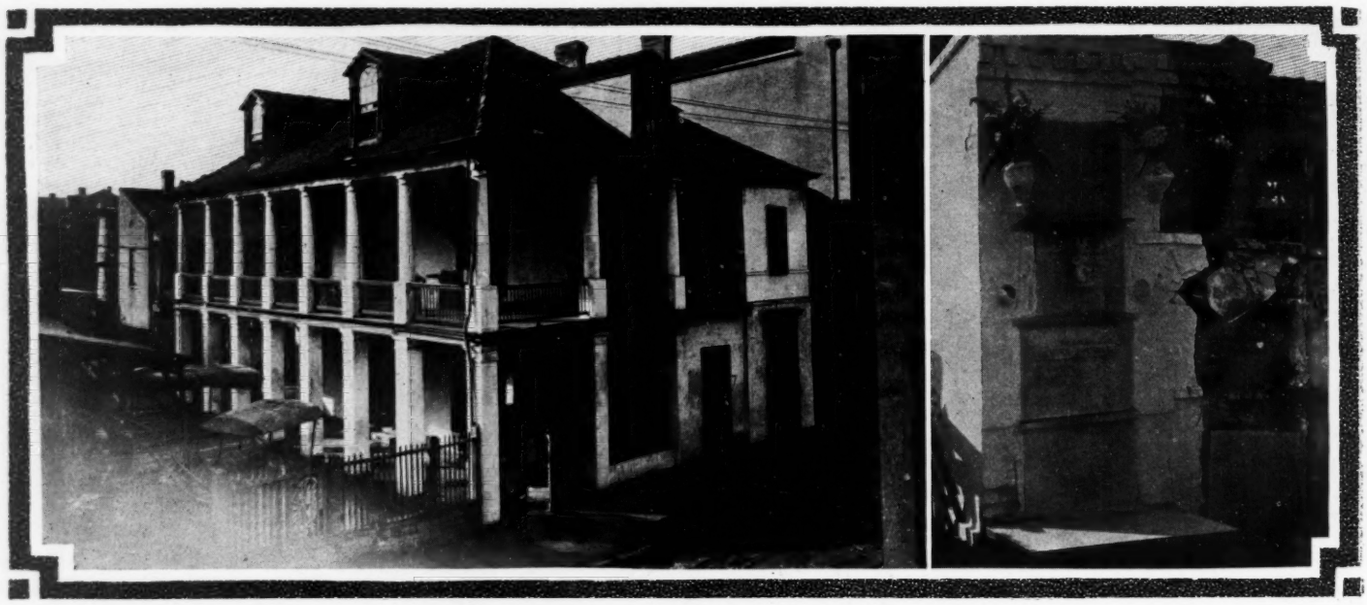
On the river side of Chartres street, between St. Philip and Dumaine, is the building once occupied by the United States courts before which General Andrew Jackson was summoned and fined $1,000 for alleged ill-treatment of Louallier, a foreigner. In the same block can be noted the former location of the blacksmith shop of Jean and Pierre Lafitte, the last pirates worthy of the name, who flourished in the Gulf of Mexico as late as 1817.

One block away is Jackson Square, Place des Armes, the St. Louis Cathedral, the Cabildo, the Presbytery and the Pontalba buildings.

The site for the cathedral was selected by Governor Bienville in 1718. The first church was erected in 1724 and destroyed by fire in 1788. The present cathedral was begun in 1792 and completed in 1794. The turrets for the towers were not completed, however, until 1813 and were designed by Mills and Latrobe. The frescoes in the interior were executed in 1792



Former home of General P. G. T. Beauregard, the Confederate leader, on Chartres street



Home of Mme. Porer, from whose gallery Gayarer, the historian, watched the Creole women wave farewell to Jackson's soldiers as they marched to meet the British

One of the tombs in the old St. Louis cemetery at the corner of Basin and St. Louis streets and a block from the boundary of old New Orleans

by E. Humbrecht. In the church is a grotto dedicated to "Our Lady of Lourdes" and over the rocks of the grotto water is continually flowing. This water is brought from Lourdes, France, especially for this purpose.

Crypt Contains Priests Remains

A crypt under the altar contains the remains of many priests, bishops and archbishops of New Orleans and within the sanctuary are interred the remains of Mandeville, Philippe, Marigny and many of the nobles of France and Spain, who held office in Louisiana during the earlier days. The sexton of the church always attends the services wearing a cocked hat and carrying a sword and halbert.

The Cabilido adjoining is historically the most interesting building in New Orleans. It was erected in 1795 for the municipality and here the Cabildo instituted by Governor O'Reilly met. The ceremonies connected with the transfer of Louisiana from Spain to France and from France to the United States in 1803, the first Protestant church service and the reception to Lafayette were staged in this structure. It was used recently as the home of the supreme court of Louisiana and is now occupied as the state museum. The museum also occupies the Presbytery, the site for which was set aside by Bienville for the Capuchin fathers. The museum contains many rare and valuable documents and exhibits connected with the history of Louisiana.

In Jackson Square, formerly the Place des Armes, situated directly opposite the cathedral, were staged nearly every incident in the colonial history of Louisiana. The large three-story brick buildings on either side were erected by Mme. Michaela Pontalba in 1849 and were the most desirable residences in New Orleans of their day.

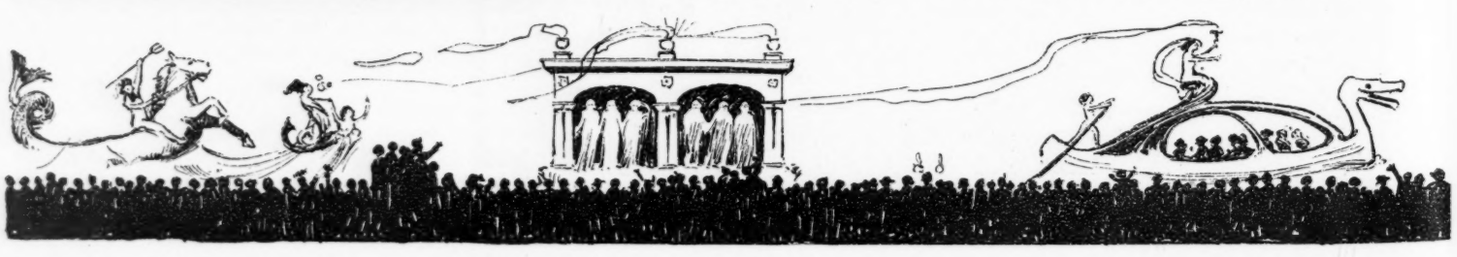
Across from Jackson Square is the French market. What is now the meat market is the site of the Spanish market built in 1791 and remodeled in 1813 and given the name of French market. The structure cost $30,000 and is of rusticated Doric order. Opposite the market is the luggar landing where the fishermen bring their catches of oysters and fish.

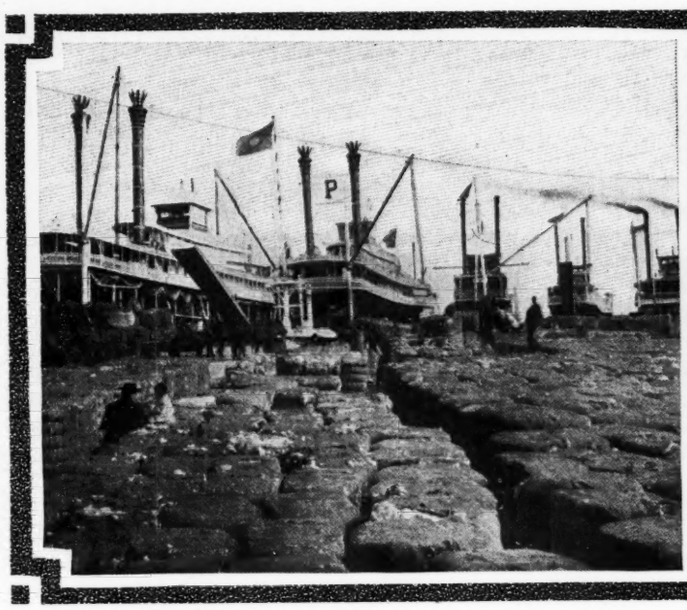
Continuing up Chartres street; at No. 514 is an imposing three-story building with two dormer windows and a belvedere. This building was erected by Nicholas Girod and was intended for the home of Napoleon I upon the termination of a scheme Girod, aided by a pirate named Dominic You, launched to rescue Napoleon from St. Helena. Napoleon, however, died before the plan could be put through. Opposite the Girod mansion is the building known as Maspero's Exchange, where General Jackson made his headquarters and planned the defense of New Orleans against the English in 1814-15. Later it became a noted slave mart.

Street of Palatial Homes

Returning to Esplanade street and following it from the river, the visitor passes through a street of palatial homes of the old regime. Finally he reaches Bayou St. John and three hundred yards north is Camp Nichols where the Confederate veterans of the Civil War are cared for. Across Bayou St. John is the handsome country club erected in 1905, with its golf links and tennis court. These are duplicated by the Audubon Club in Audubon Park at the other extremity of the city.

Adjoining the property of the country club is City park with its magnificent avenues of giant oaks. Beneath these oaks were fought countless duels in the old days. Some of these of note were engagements in which Emile LaSere, member of





Loading cotton at the New Orleans' wharfs on boats bound for England

Headquarters of General Pokenham, leader of the British in the attack on New Orleans

Congress, figured. He fought eighteen times in the City park. P. Micajah Lewis, secretary to Governor Claiborne, the first American governor of Louisiana, was killed here in 1843 and Senator Waggaman some time later in a duel with Emile Prieur. On one Sunday in 1837, ten duels were fought, one between Colonel Schaumberg, U. S. A., and Alexander Cuvelier, on horseback with broad swords.

Historic Spots

Going to the lower end of the city you reach the Jackson Barracks, on the parish line, now an artillery post. A quarter of a mile further is the American Sugar Refinery, fifteen stories high, and three-quarters of a mile beyond the city limits is the battlefield where Jackson met and defeated the British in 1815. Near this locality are the Frisco terminals, the Chalmette National Cemetery, the Chalmette Monument, the shaft occupying the spot where the American standards were displayed during the noted engagement with the English, and still further about two miles below New Orleans, is Port Chalmette.

Returning to Canal street and going to Basin street the tourist will cross Rampart street, the line of the outer fortifications of old New Orleans. At Rampart and St. Louis is the Church of St. Anthony, the old mortuary chapel, and, next to the cathedral, the oldest church in New Orleans from which all Catholic families buried their dead as recently as 1870.

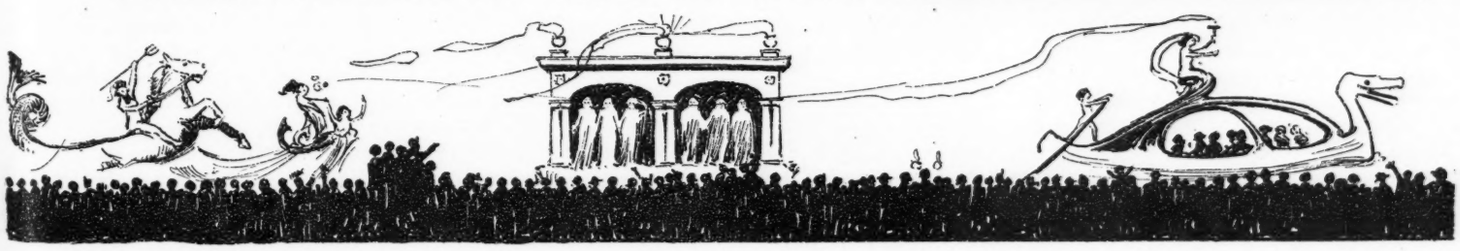
A block beyond is the St. Louis cemetery used by the church as early as 1788. This cemetery contains the tombs of many of the city's illustrious dead including Benedict Pradelle, an officer in the Revolutionary Army under Lafayette; Michael Dragon and Michel Fortier, officers in the Army of Glavez, Charles Benoit de Lasalle, brother of the great explorer, General Claiborne, the first American governor of Louisiana and numerous others.

Out Canal street at its termination are located the beautiful Greenwood, Meterie, Firemen and St. Patrick cemeteries.

Following St. Charles avenue from Canal street the tourist will pass through the garden district of the city, where the social element of modern New Orleans now resides. He will pass Audubon Park and opposite Loyola College, of the Jesuit Fathers, and Tulane University, with its noted medical and law departments. Continuing, he will enter Carrolleton avenue and on the Tulane avenue back to Canal, a twelve-mile belt of paved streets lined with trees and palms, with a neutral ground forty feet and more wide. In Tulane avenue is the famous Charity Hospital and Hotel Dieu.

Unique in the history of the city is its carnival. This period of fun-making and joy was inaugurated in 1857 and is the season between Twelfth Night and Lent. The climax is reached by costly festivities, Mardi Gras Day—Fat Tuesday. The word carnival means "carne" "flesh" and "vale," "farewell," and a gay goodbye is given the flesh, mortified during the forty days of Lent. The pageants consisting of street parades reproduce scenes from history, literature and art and are represented by handsomely decorated floats. One of these pageants costs at the least, $30,000, and there are five.

The first parades the streets the Thursday before Mardi Gras and is in charge of the Knights of Momus, who made their debut in 1872. This is followed by the arrival of Rex and a military and civic parade Monday afternoon. He is welcomed to the city amid the roar of cannon and the shrill blasts of sirens. He rules supreme for thirty-six hours.



Reach High Export Mark

Motor Vehicles and Parts Exported Total $11,180,149 in 1915

Commercial Vehicles Lead in Value Over Motor Cars

WASHINGTON, D. C., Feb. 22—Special telegram—Motor vehicles and parts, valued at $111,180,149, were shipped to foreign countries by American manufacturers during the 12 months, ending December 31, 1915, according to the figures issued yesterday by the department of commerce.

Our export trade for 1915 consisted of 22,082 trucks, valued at $59,834,246; 41,869 passenger cars, valued at $35,045,492; and $16,300,401 worth of parts.

This represents an increase in our motor vehicle exports of approximately 200 per cent over 1914, when the total value was $34,171,568, divided as follows: 3,430 trucks at $8,985,756; 22,335 passenger cars at $19,521,708; and parts worth $5,664,104.

John Bull was our heaviest buyer in 1915, taking 24,355 cars and trucks, valued at $35,055,097, or more than the total value of U. S. motor exports to all foreign countries combined the year previous.

The shipments in December, 1915, were as follows: 1,664 trucks at $3,920,533; 3,664 passenger cars at $2,710,758; and $1,791,805 worth of parts. For December, 1914, the exports were as follows: 1,279 trucks at $3,387,739; 1,297 passenger cars at $998,698 and $1,791,805 worth of parts.

BRICK PRICES ADVANCED $35

New York City, Feb. 21—An advance of $35 in the price of the Buick light sixes has been made by the Buick Motor Co., Flint, Mich. The roadster will sell for $985 and the touring car for $1,020 at the factory.

The light six will carry 34 by 4-inch wheels and tires, instead of 32 by 4-inch as originally on this series. These prices and models will run through the entire 1916 season.

POLICEMEN MUST BUY CARS

Chicago, Feb. 19—A paradox has developed in the Chicago police department. Ninety per cent of the owners of cars will not deny that it costs money to own a motor car and the other 10 per cent know it whether they admit it or not, but it is doubtful if very many could be found who will admit it costs money not to own a car. There are exceptions of course—ten of them to be exact—and these ten are captains of as many precincts of the Chicago police department.

About a year ago a request was made that the police captains' salaries be increased from $2,250 to $3,000 a year on the plea that they needed motor cars to conduct their police work and that on the $2,250 a year, the purchase and maintenance of a car was out of the question with them. The request was granted and thirteen—it might be called the lucky thirteen—carried out the agreement and purchased cars. Ten captains, however, still use the street car or walk and they now face the problem of going back to $2,250 a year or purchase cars.

Who says thirteen isn't lucky?

ADAMS LEAVES STEWART-WARNER

Chicago, Feb. 21—Gridley Adams has resigned as advertising manager of the Stewart-Warner Speedometer Corp., a position he has held for the past 3 years, and purchased an interest in the Macavoy Advertising Agency of this city.

S. A. E. TO MEET ON LAKE

Detroit, Mich., Feb. 18—The annual midsummer meeting of the Society of Automobile Engineers will take the form of a four-day excursion on steamer "Noronic," leaving Detroit the afternoon of Monday, June 12 and returning Friday afternoon, June 16. Accommodations for over 500 members will be provided on the boat. The boat trip will embrace points in Lake Huron and Georgian bay.

MAXWELL TO SELL CHASSIS

Detroit, Mich., Feb. 22—Special telegram—The Maxwell Motor Co. is entering the light-delivery car field. No special car will be made but as the company believes that its standard chassis is well adapted for such a purpose it will furnish the touring car chassis complete with cowl instrument board and electrical equipment but without body at $565 or $90 less than the price of the standard touring car. Purchasers will receive a scale of dimensions which will enable any body builder to fit any type of body to the frame.

LOUIS CHEVROLET IN NEW CONCERN

New York City, Feb. 21—Louis Chevrolet and a group of eastern business men, including W. H. Hoople, president of the Interstate Electric Corp.; J. C. Spiers, formerly general manager of the Autocar Co. and factory manager of the Locomobile, Mercer, S. G. V., and Standard Roller Bearings companies, and G. F. Baright, formerly advertising manager of the Pundential Life Insurance Co., Newark, N. J., have completed the organization of the American Motors Corp., which is to engage in the manufacture of a car on a large scale.

The company is capitalized at $1,250,000. Its first output will consist of a moderate priced car. Louis Chevrolet, vice-president and chief engineer of the company, is also president of the Frontenac Motor Co., Detroit, builder of racing cars of his own design. The main plant of the new company will be located in the East.

Perlman Decision Upheld

New York Court of Appeals Affirms Previous Ruling on Infringement

Case Especially Interesting by Reason of Wide Use of Rims

NEW YORK, Feb. 18—The United States circuit court of appeals, Justice Lacombe presiding, has just handed down a decision affirming the decision of Justice Hunt, C. J., in the United States district court, who declared the Perlman demountable rim patent valid, and infringed by the Standard Welding Co., Cleveland, O. An injunction and accounting order against this company was issued last August by the lower court.

The Perlman demountable rim patent case is of more than ordinary interest because it affects the use of demountable rims on nearly all the cars made and now in service in this country. The Ford is the only car which does not use demountable rims as a regular and standard equipment.

The Perlman demountable rim patents were applied for in 1906, and the patent was finally granted after many years of delay in the patent office, on February 4, 1913.

$2,000,000 TAX FOR FORD

Detroit, Feb. 19—The Canadian Ford Motor Co. figures that if the war budget submitted to parliament is adopted, and it is almost certain that it will be, it will shoulder at least $2,000,000 of the burden.

This amount means one-fourth of all its profits in excess of 7 per cent on the capital invested covering a period from August, 1914, to August, 1917.

"We have no criticism to offer," said Assistant Manager Campbell today. "We realize the war tax must be raised and we will do our part cheerfully. It will make little difference to our stockholders, the bulk of profits being set aside for plant enlargement."

NEW MAKER FOR KALAMAZOO

Kalamazoo, Mich., Feb. 19—The States Motor Car Mfg. Co., capital $600,000, has been organized here and will immediately begin the manufacture of four- and eight-cylinder pleasure cars and a light commercial wagon. The officers are: John Pyl, Kalamazoo, president; James H. Johnson, South Haven, vice-president; B. R. Barber, Kalamazoo, vice-president; Samuel Hoekstra, Kalamazoo, secretary-treasurer. The directors are: John Pyl, B. R. Barber, George B. Pulfer, H. E. Johnson, Kalamazoo; W. B. Smith, Toledo; Ira Cadwallader, Fostoria, Ohio; James H. Johnson, South Haven.

The company has acquired by purchase the plant of the defunct Michigan Buggy

Co. The total floor space aggregates 340,000 square feet, the buildings being in splendid condition. It is planned to make the first delivery of cars by April 15.

According to plans of the incorporators, the product will be handled by the States Motor Car Co., a selling organization with 40 zone managers and a combined capital of $1,700,000. The offices of this company will be located in Kalamazoo, the general sales manager being W. B. Smith. The parent company is fully organized, while zone managers have been secured for Michigan, Ohio, Indiana, Iowa, Minnesota, northern Illinois and southern Wisconsin, southern Illinois and southeastern Missouri and Missouri.

The same chassis will be used for both touring cars and roadsters in the weights. The wheelbase will be 115 inches, the weight will be kept down to 2200 pounds.

GOOD YEAR FOR GOODRICH

New York, Feb. 19—The B. F. Goodrich Co. in 1915 showed a surplus of $10,305,679, equal to 17.17 per cent on the $60,000,000 common stock, as against $3,371,927 in 1914, equal to 5.62 per cent.

Net sales for the year ended Dec. 31, 1915, aggregated $55,416,866.55, as compared with $41,764,008.66 for 1914, representing a gain of 32½ per cent. Net profits amounted to $12,265,679, compared with $5,440,427 in 1914.

The directors of the company voted, subject to the approval of the shareholders, to retire 7,000 shares of the preferred stock. This is in accordance with the provision of the company's charter, which provides for the retirement of a minimum of 9,000 shares of the preferred stock each year, beginning with July, 1914. As last year the company retired 2,000 shares in excess of the charter requirements, it was necessary to retire only 7,000 shares additional prior to July, 1916.

CONTINENTAL MOTORS INCREASES

Detroit, Feb. 17—At a meeting of the stockholders of the Continental Motor & Mfg. Co., it was decided to increase the capital stock from $2,900,000 to $5,900,000, to declare a stock dividend of 100 per cent, to reduce the par value of the shares from $100 to $10 and to shorten the name of the company to that of Continental Motor Co.

Owners of the old shares of stock will receive ten shares of the new stock for each old share plus ten shares additional as their stock dividend per old share.

An output of 125,000 or more motors is scheduled for 1916 or about 80,000 more than in 1915. At the present time the daily average output is about 200 motors at both the Detroit and Muskegon plants. It is expected that this output will be increased to 300 per day within the next three weeks when about 6,000 men will be on the company's payroll.

Fight Gas Price Raise

Bay State Motorists Unite in Move Against Boost in New England

Cost to Consumer in Other Sections Continues to Go Up

BOSTON, Mass., Feb. 21—Massachusetts motorists have taken up the cudgels in the fight to reduce the price of gasoline in New England. At the request of the Bay State A. A., of Boston, Representative Thomas J. Giblin, one of the members of the Massachusetts legislature, has put in a resolution requesting that action be taken. He has asked the legislature to send a resolution to its senators and representatives at Washington requesting them to take such action as will result in lowering the price of gasoline in the East, where its high prices now jeopardizes the motor business of Massachusetts.

Another start was made also at Springfield when the Automobile Club of that city had its annual banquet attended by 750 members and friends, among them people of note in the Bay State. Thomas L. Hisgen, former Independent party candidate for president, was the principal speaker, and he said unless some action is taken gasoline would be 50 cents a gallon in a year. He is a big oil operator and said:

"Every oil field in the United States is producing more gasoline from each barrel of crude oil than at any stage in its history, because of modern efficiency. Figures based upon crude oil production are deceptive. Figures based upon gasoline production prove that the man who talks of shortage is either a chronic pessimist or an enemy of truth."

The Springfield Club has asked all the other Massachusetts clubs to aid it in fighting the monopoly.

The price of gasoline in Tacoma and Seattle increased another cent during the past 10 days, and the prevailing price is now 17½ cents. Another 1-cent increase was made in Portland, Ore., during the past week, which makes the sixth similar price raise since the big demand. At Spokane, Wash., and throughout the Inland Empire the price on gas has jumped to 20½ cents.

PROBE PLUGGED OIL WELLS

Omaha, Neb., Feb. 18—That oil wells in Arkansas are being deliberately plugged and their output shut off in order that the price of gasoline may be kept at a high figure was the charge preferred by President W. H. Brace of the National Cleaners and Dyers Association, at the annual banquet of the Nebraska association in Omaha. Mr. Brace said his information came to him directly from a close personal friend who was a resident of the Arkansas oil territory.

"Three new wells struck in Arkansas within the last few weeks have been plugged," he said, "according to the information given me. I am also inclined to believe that some big wells in Kansas which are now flowing water are being made to do so by means of some mechanical subterfuge, in order to give the appearance of having run out."

The association decided to send petitions to congress to ask the congressional investigation committee to go to the bottom of the matter, regardless of expense. The war tax on gasoline was also protested.

Gasoline in Omaha has been selling at 18½ cents to 20 cents per gallon for nearly a month past. Local managers for the oil companies say they see no immediate prospect of any change.

TWO MODELS FOR SCRIPPS-BOOTH

Detroit, Feb. 18—The Scripps-Booth Co. has advised its dealers that the four-cylinder roadster model is henceforth to sell at $825 instead of $775, an advance of $50. It is also made known that the speedster model shown at the New York and Chicago shows and called the Vitesse is not to be marketed, nor is any form of eight-cylinder roadster to be made. Besides the four, the line will include only one other model, this being an eight-cylinder four-passenger car selling at $1,175.

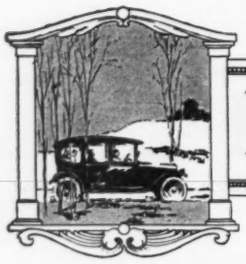
ENJOINED FROM IMITATING PLUGS

Toledo, O., Feb. 18—The Champion Spark Plug Co., Toledo, O., has secured a permanent injunction against the Keystone Auto Supply Co., restraining the latter concern from manufacturing or selling an imitation of the Champion X spark plug for Fords. The decision was handed down by the District Court of Western New York.

This is but the first of a series of suits which the Toledo concern intends to bring against alleged imitators of their Champion X plugs. For five years this special spark plug has been used as regular factory equipment on Ford cars.

ANOTHER FOR PREST-O-LITE

Indianapolis, Ind., Feb. 19—A preliminary injunction against the Sun-Lite Gas Co., of Wichita, Kans., and in favor of The Prest-O-Lite Co. has been issued by the U. S. district court of the district of Kansas, second division. The injunction follows the customary lines—compelling the Sun-Lite Co. to remove the Prest-O-Lite company's trade-mark, the effect of which is to take the cylinder entirely out of the Prest-O-Lite exchange system. The injunction also restrains against the fraudulent substitution of any such nameless tanks upon a Prest-O-Lite user who presents an empty Prest-O-Lite tank with the expectation of having it exchanged for a full one.



EDITORIAL PERSPECTIVES

The Gasoline Price

WITH gasoline rising and prospects of still higher prices, a few motorists already are planning to limit their season's use of the car so that the total fuel bill for 1916 will be little if any larger than last year. This means fewer gallons used, fewer touring miles and perhaps restricted pleasure in the use of the car. Rather than begin by cutting off a definite portion of your pleasure, why not set out to see how you can make a gallon of gasoline go further in 1916 than it did in 1915. This is a positive suggestion. It can be done. Last year you gave little heed to fuel consumption. It was negative with you. You purchased gasoline at 11 cents per gallon, some lower, and you kept no record. Today, because gasoline has more than doubled, you are going to cut your touring in half. This would be poor policy.

EVERY motorist can get more miles per gallon if he or she will devote some intelligent thought to the subject. To get these extra miles will call for a little gasoline attention, just as you have been taught in the past to give your tires some attention and as you were taught last year to give the battery attention. So 1916 promises to be a gasoline year.

MORE mileage can be obtained by keeping the valves in better condition. Have them ground regularly. Perhaps you do not know how often they should be ground. Get the habit of trying the compression. Now that you have a starter that will be more difficult, but it is worth while. You lose power when the valves need grinding because a portion of the charge sucked into the cylinders escapes during the compression stroke. Save this escaped portion of the charge and you will be saving on your gasoline bill.

THERE are other ways in which you can save on gasoline. Carbon in cylinders means waste of gasoline. When the cylinder is carbonized the power fails. Instead of climbing a hill on high you have to shift on second. The reason lies in the carbon causing a premature explosion. The combustion of the charge is not so good. The burning is too slow. You lose power. Your mileage per gallon falls. Keep the cylinders well cleaned. It may be dollars and cents in your pocket to pay for more frequent carbon removals, rather than pay for the wasted gasoline. You can go further: The better ignition the less gasoline is used. The points on the spark plugs should be the correct distance apart. They should be regularly inspected. If they get too close you will have missing on high speeds; if too far apart you may have missing. All missing means wasted fuel. The breaker points in the magneto should be frequently looked over. The better condition they are in the better for gasoline economy. Then you can keep the battery in a more fully charged condition if you depend on it for your ignition current supply.

LASTLY, many miles can be saved by a better adjustment of the carbureter. More scientific handling of it is needed, not foolish adjusting and readjusting to meet your whims, but a more adequate knowledge of carbureter functions and the first principles of carbureter adjustment. For several years there have been not a few carbureter attachments marketed several of which have not possessed any peculiar merit, but which have brought greater fuel economy. The economy consisted in the fact that there was a finer carbureter adjustment, less expenditure of fuel and a closer adjustment of the needle valve to conditions. The attachment did not introduce any new principle into carburetion, but merely turned the driver's attention to the carbureter. In not a few instances as good economy could have been obtained without the attachment or the mixture added to the gasoline. The first and last of the system lay in the better adjustment. So this year gallons can be saved per week, if you do much touring, on better carbureter adjustments.

THE number of miles obtained per gallon of gasoline can be slightly increased by more care being given to your car in general. Last season you did not give as much attention to turning down grease cups as you should have done. Grease cups on springs received little, if any, attention; so with many others. Give them more attention this year. The watchword is to get more out of the fuel than you did last year. Keep the front wheels better lined up, keep your tires at a better point of inflation; in short, there is a score of things you can do that, when totalled, will add to your mileage per gallon.

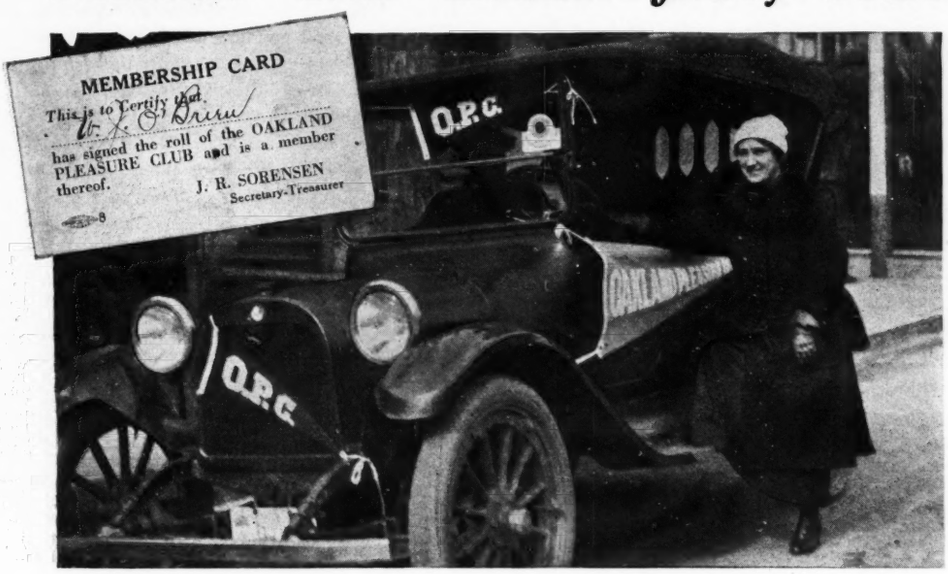
Enjoying Your Tour

TODAY is the best time to prepare for your annual summer or vacation motor tour, whether that tour is scheduled to start June 15, July 1 or September 1. Touring is like salesmanship; you should start laying your plans a long time in advance. The good salesman starts his advertising campaign well in advance of the date of delivering his goods in order that he can cash in to the best advantage in sales. The wise tourist can get more enjoyment out of the tour by selecting his touring route well in advance. It is not necessary to arrange the details but to select the part of the country you intend to tour through and then prepare yourself for getting the most enjoyment out of the trip. The more you read about the country you are to tour through the more pleasure you will get out of the trip. It is like the person attending grand opera. The more he or she knows about the opera the more it is enjoyed, the more educational. Turn to a grand painting: The more you know of art the more can you read out of the picture, the more inspiration you absorb, the better you are off. Apply this to touring.

Tonneau Speedometers

GRANTED that the person sitting in the rear seat of a touring car is often more financially interested in whether the car is exceeding the speed limit than the driver, and further granted that rear seat passengers, when touring, are generally interested in speed and distance covered, it is logical to conclude that a tonneau speedometer is desirable in all touring cars. The idea of a tonneau speedometer is not new. Examples of it were shown many years ago and each season one or two examples come up, but generally in connection with custom made jobs. The tonneau speedometer has never been taken seriously as stock equipment, but there is a possibility that in touring cars, listing at $750 and up, that it will receive more consideration. That it will serve a useful purpose there is no argument, providing it is mounted so that it can be seen, and not where it will be obscured by every duster or rain coat on the robe rail. The problem of installing a tonneau speedometer has been simplified by the more general adoption of propeller-shaft drive. Taking the drive from the propeller shaft makes it easier to drive an instrument in the tonneau.

Pleasure Club Evades Jitney Rule



Miss Rose Ray, the first woman to join the Oakland Pleasure Club. She makes twenty to thirty trips daily to the fashionable Piedmont district

OAKLAND, Cal., Feb. 22—The jitney bus has been eliminated from the downtown district of Oakland. There are a few nicolodian motor cars still operated in the suburban districts, but the day of the nickel picker is past. Touring cars, with the signs "Pleasure" plastered conspicuously all over them, have survived the jitney legislation.

The particular brand of "Pleasure" which has taken Oakland by storm is the result of the last decision of the city dads against the jitney wagon. The streets had been congested with the extra traffic and the climax came when the street car companies began to yell for a chance to run harmlessly down the street without even considering the loss of money suffered. The city council opened fire one morning and ordinanced the jitney out of Oakland. Then "Pleasure" cars took their places.

Formed by Jitney Bus Operators

The good people of this beautiful California city had become accustomed to riding in motor cars at 5 cents per ride and there was no ordinance forbidding the organization of a "Pleasure" club. So, when the jitney men saw their business go glimmering, they formed the Oakland Pleasure Club.

The owners donate their cars to the club. The club pays the bills for gasoline, oil, tires and repairs and also the salaries of its drivers. Anyone may become a member of the club upon payment of a small fee and it is an easy matter to secure a membership card. The drivers do not collect fares. That is against the law. But it is legitimate for members to contribute what they wish toward the upkeep of the club's cars which are used for the "pleasure of members only."

On each car there is a small jar or receptacle for contributions. Over the jar is a sign reading: "For donations to the Oakland Pleasure Club, give what you wish." No member will ride without giving something and they all have the jitney habit so the club reaps a great harvest of nickels daily.

For the convenience of those who wish to join the club on short notice, the driver of each car has a large supply of membership cards which are given to those who wish to enjoy the pleasure of the club's equipment, as it is against the law and the rules of the club for anyone but members of the club to ride in one of the "Pleasure" cars.

The idea proved popular from the start and already there are something like 12,000 regular members, with cards, going on pleasure jaunts daily.

Pennants bearing the letters "O. P. C." also designate the route over which the car travels on its quest of pleasure so that no member need fear being carried in the wrong direction.

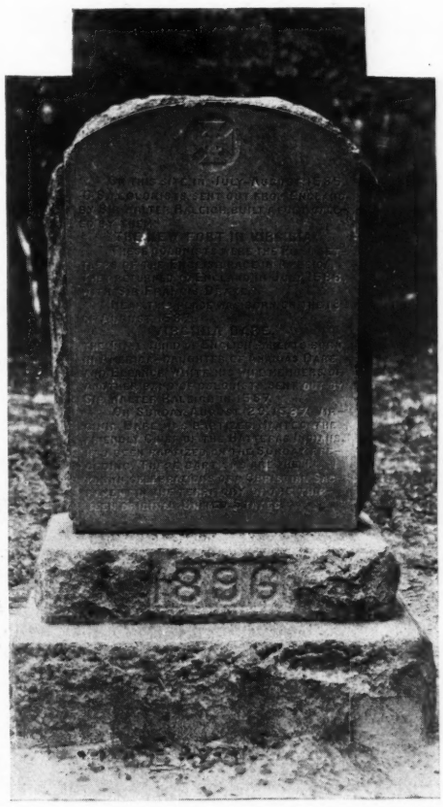
The by-laws of the club read something like this:

It is the first object of this organization to induce owners of automobiles to donate their cars to the association for the purpose of enabling its members to obtain a glimpse of Nature's beauties, a breath of God's fresh air and a little place in the sun among the pleasures reserved for the rich.

The political object of this club shall be to obtain for the people the same use of the public highways which is enjoyed by the rich and powerful.

The by-laws further state that owners, carrying members on pleasure rides, shall receive no compensation, but that the drivers of the club cars shall receive regular salaries from the club treasury.

See America First — See America Now



EDITOR'S NOTE—This is the sixty-seventh of a series of illustrations and thumb-nail sketches of the scenic and historic wonders of America to be published in Motor Age for the purpose of calling attention of motorists to the points of interest in their own country

NO. 67—THE SITE OF RALEIGH'S COLONY

Off the east coast of North Carolina and near the entrance of Albemarle sound, lies Roanoke island, one of the most historic points in all America and associated with the names of the earliest English colonists in the south. At the northern end of the island, 3 miles from Manteo, the county seat of Dare county, the tourist can read a bit of poignant history on a slab of granite and on the magic carpet of imagination be carried back into the past 331 years. The monument bears the following inscription:

"On this site, in July-August, 1585 *(O. S.), colonists, sent out from England by Sir Walter Raleigh, built a fort, called by them*

'THE NEW FORT IN VIRGINIA'

"These colonists were the first settlers of the English race in America. They returned to England in July, 1586, *with Sir Francis Drake*

"Near this place was born on the 18*th of August,* 1587

VIRGINIA DARE

the first child of English parents born in America—daughter of Ananias Dare and Eleanor White, his wife, members of another band of colonists sent out by Sir Walter Raleigh in 1587."

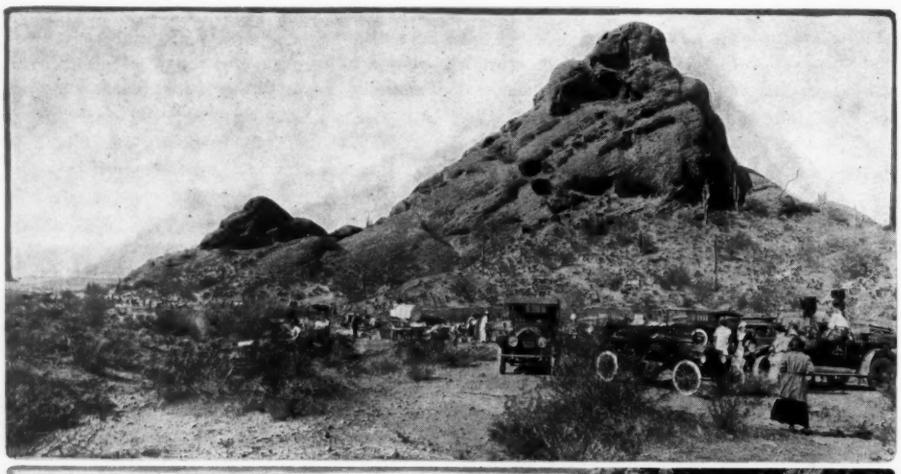
Arizona Has Good Roads Celebration

Headed by Governor, 500 Residents Build ¾ Mile of Highway

THE biggest road celebration in the history of Arizona was held February 14, in Papago Saguaro national park, 6 miles east of Phoenix. Nearly 500 residents of the Salt River valley, which includes Phoenix, Tempe, Mesa, Chandler, Scotsdale and Glendale, gathered on the scene in the early morning and spent the day with picks, shovels and scrapers, building ¾ mile of road through the most picturesque scenery to be found in the vicinity of Arizona's capital. Governor George W. P. Hunt, Mayor George U. Young, of Phoenix, and many other notables took part. A creamery company at Tempe sent twenty-five of its employes and several teams.

This is probably the most difficult piece of road building ever undertaken at a celebration of that kind. There was much rock work, necessitating the use of dynamite. Even though conditions were far from ideal much was accomplished.

At noon the wives, sweethearts and daughters of the enthusiastic road builders served a barbecue picnic lunch among the sauguaros, octillos, greasewood and palo verde trees. Ideal weather prevailed. The sky was cloudless and the temperature was a little warmer than was necessary for comfort.



Upper illustration—cars parked during road building celebration near Phoenix, Ariz. Lower illustration—Road below Roosevelt dam after Salt river flood which washed the surface off the highway, leaving only the rock foundation

TWO ROADS FROM MEMPHIS

Memphis, Tenn., Feb. 19—The Jefferson Davis highway was advanced several degrees toward becoming a reality when an association consisting of Kentuckians, Tennesseans and Mississippians organized an association which will push the construction of the road with vigor. As a matter of fact, the meeting held in this city yesterday will result in two highways from Memphis south.

The Jefferson Davis Highway Association voted that the big trail should pass through the hill counties of Mississippi, but advocates of the Yazoo route announced that they were going to build a highway through the valley and that it would be completed before the road along the line officially approved. When their way is finished, they will ask that it be declared the Mississippi link of the highway.

The definite route has not yet been settled, there being two alternative hill routes. Two routes had been selected for consideration but advocates of a third, known as the east hill route, came in force and secured a hearing. A meeting will be held at Grenada, Miss., March 2, to decide which shall be named. There is no contest between the two south of Grenada. The two routes are not far apart.

The east route is from Memphis to Olive Branch, Independence, Oyro, Oxford, Water Valley, Coffeeville, Grenada. The other passes from Memphis to Hernando, Sardis, Senatobia, Batesville, Grenada. The Yazoo proponents will meet at Greenville, Miss., March 1. They state that three-fourths of the counties along the route have already voted bonds for the construction of their part. Their road touches Tunica, Clarksdale, Duncan, Indianola, Yazoo City, Jackson.

All three routes go to Jackson, the state capital, from which the road will go to Beauvoir, the old home of the Confederate leader. There will also be a branch to New Orleans. The name of the Paducah-Memphis highway was changed to conform with the title of the route. From Paducah the road extends to Springfield, Ill., thus furnishing a continuous highway from Chicago to Memphis and New Orleans.

The attendance included 1,000 delegates. Practically every county in Mississippi was represented, some counties having as high as 100 delegates. C. C. Hanson, of the Memphis Business Men's Club, was elected permanent chairman and John M. Tuther, of the same organization, permanent secretary. If a bill now pending in the Mississippi legislature permitting counties to issue bonds for roads in other counties is passed, the road will be completed, it was stated, by September 1, 1917.

TRUCK SOON PAYS FOR SELF

Tucson, Ariz., Feb. 21—To pay $5,000 for a motor truck, use it 8 days, and make money on the deal, was the experience of the Ray Brothers, mine operators of Tucson.

The Rays held an option on the Mineral Hill copper mine, south of Tucson, and struck rich ore. They said as little as possible about their luck and counted confidently upon securing a renewal of the lease. But the Pittsburgh owners of the Mineral Hill got wind of the strike and

on Saturday, February 12, notified them by telegraph that they would be expected to relinquish possession of the mine February 20, when their lease expired.

At 11 o'clock, February 12, the Rays placed an order with H. A. Deans for a White truck. The order was wired to Los Angeles and the truck was shipped to Tucson by express. It arrived at 3 p. m. Sunday, February 13, and at six o'clock that evening started from the Mineral Hill mine for Sahuarita, the nearest railroad point, loaded with ore.

Until the very last minute of the life of the lease, the truck was kept in operation. The Rays have not received their final smelter returns so they do not know just how much they made, but they know that they realized a profit greater than the $5,000 they paid for the truck and have a practically new machine on their hands.

MILITIA TO HAVE TRUCK COMPANY

New York, Feb. 18—Major-General John F. O'Ryan has authorized a plan by which motion pictures will be used to raise funds for the equipping of four motor truck companies for the National Guard of New York.

The companies will consist of twenty-eight motor trucks to cost about $3,000 each, accompanied by five motorcycle corporal's mounts, and to be organized on lines laid down by the Automobile Reserve Corps.

The plan, according to Lieutenant J. W. O'Mahoney of the Coast Artillery Corps, N. G. N. Y., is to give motion picture shows in the various armories throughout the state, the films being loaned by their owners. A fund of $100,000 is expected as proceeds of this plan.

WOULD MOBILIZE MOTORS

Chicago, Feb. 19—Major Amos A. Fries, of the U. S. Engineer Corps, in an address before the national conference on concrete road building Tuesday, made a strong plea for the organization of the motor vehicles of the country, the training of men to operate them and the preparation of good roads throughout the country for purposes of defense. It is his opinion that it ought to be possible to mobilize 200,000 vehicles of different types in any locality in one week or less. Such vehicles, he thinks should be sufficient to move from 600,000 to 800,000 men 150 to 300 miles a day provided the proper provision were made.

TAMIAMI TRAIL IN FLORIDA

Tampa, Fla., Feb. 22—Plans are being made for the building of another big highway in this state, the new road being a link between Tampa and Miami and wearing the poetical name of Tamiami trail. This route will cross the Everglades, thus giving tourists an opportunity to see one of the most interesting sections of Florida.

Makes World's Smallest Motor Car

One-Cylinder Vehicle Measures 72 Inches

P. H. Eastabrook, a mechanic at Grand Rapids, Mich., has constructed what is believed to be the smallest motor car in the world. The length over all is 72 inches; the width, 30 inches and the height, 23 inches. It is equipped with a single cylinder motor and it responds readily to the touch of Eastabrook's 4-year-old son. The tot is, without a doubt, the youngest chauffeur in Michigan.

Eastabrook purchased many of the parts of the machine, but the bulk of the forging and machine work he did himself. He assembled the car in his woodshed. The machine is equipped with electric lights, electric horn, duplex steering gear, external contracting brakes, speedometer, clock and gas pump. It has a tread of 22½ inches and a wheelbase of 50 inches. Solid rubber tires are mounted on the 14-inch wheels. It carries five dry batteries and is roller bearing throughout.

Eastabrook's son drives the machine at will about the neighborhood and occasionally goes out for a spin of a mile or more. The gears are low and it is impossible for him to make more than 8 or 10 miles an hour.

OMAHA SHOW OPENS

Omaha, Neb., Feb. 18—Ten times greater than the first show in 1906, the eleventh annual motor show of Omaha, held in the municpal auditorium, is staged in a Japanese garden setting, colored in orange, black and white, and lighted in a manner as beautiful as it is mysterious. How the lighting effect, in which thousands of electric bulbs are used, is achieved, remains for the present a deep, dark secret in the hearts of the few chosen men who conceived it, but all are agreed that the effect is enchanting to say the least.

Every inch of space in the main floor and the basement has been taken upon by dealers and manufacturers, and the balcony has been commandeered as a rendezvous for motorcycles.

More than 200 cars will be on exhibition for the week of February 21-26, and the show is expected to draw the attendance of at least 90 per cent of the dealers of this territory to Omaha's hospitable gates.

NASHVILLE HAS SHOW

Nashville, Tenn., February 18—The first exhibit of Nashville motor car and accessory dealers came to a close tonight, having presented 6 days. The attendance is estimated at 20,000, the patronage having grown steadily during the week. Both from the dealers' and the public's standpoint, it was a successful event. Sales of individual dealers reached as high as eight cars.

BAN ON JOY RIDING IN BRITAIN

London, Feb. 17—Motoring for pleasure is characterized as selfish, thoughtless extravagance in an appeal issued today by the government's war savings committee. In speaking of riding for recreation rather than business the appeal states:

"If this form of selfish, thoughtless extravagance is stopped, millions of pounds will be saved and many workers transferred to more useful channels."

The sponsors for war economy think motoring has a bad moral effect on the poorer classes, stating that these people cannot be asked to save as long as they see the rich enjoying such luxuries.

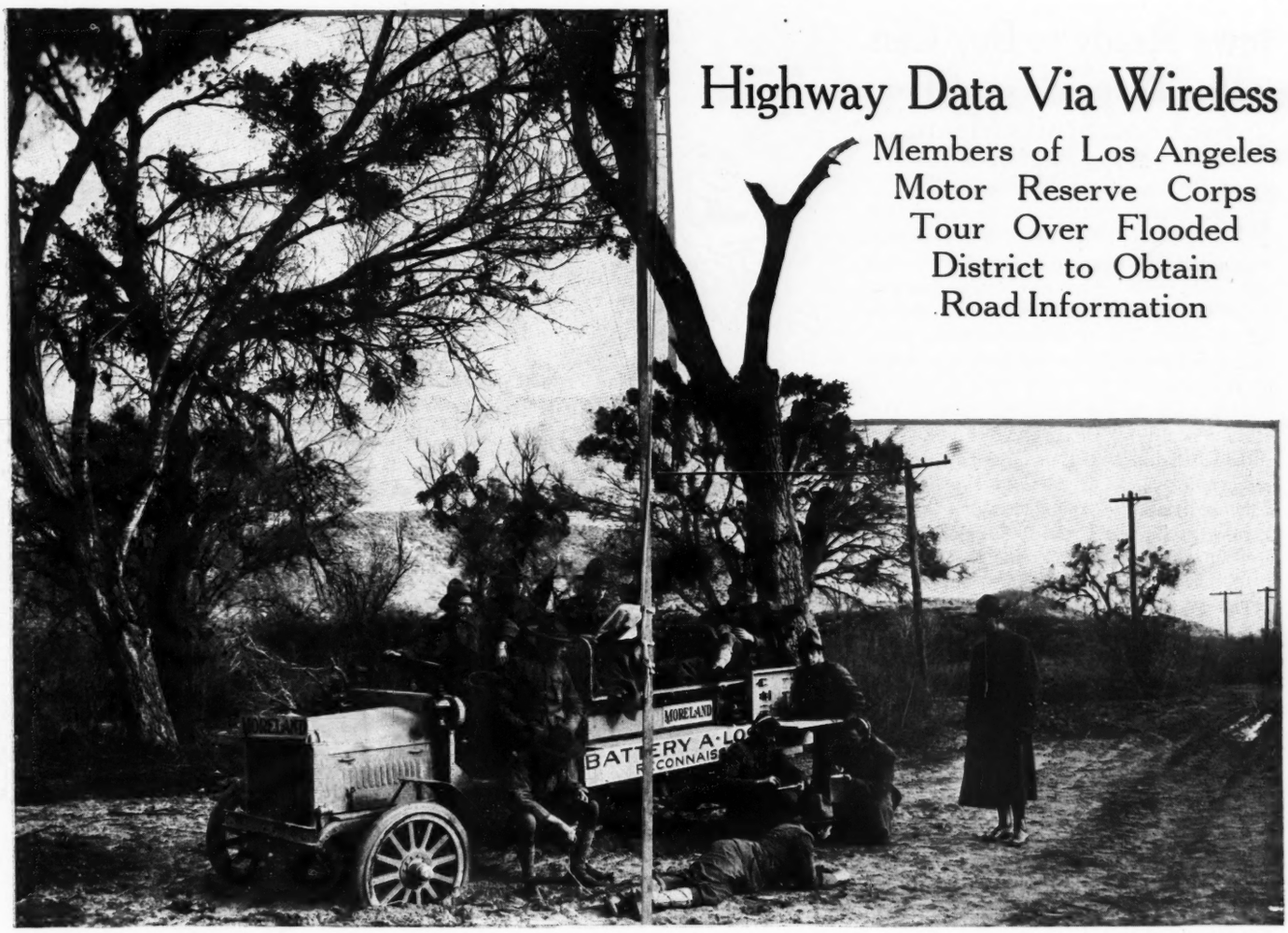
At top is shown the wireless and field telephone, used by the motor reserve corps to transmit road information to Los Angeles, in action. The bridge was washed out and the signalman and field phone operator crossed on the pipe-line

At left is the truck used by the citizen-soldiers of California. The wireless outfit, field telephones, ropes and tools are stored in a small space, giving ample room for fifteen men

In the bottom illustration, the reconnaissance truck is shown crossing the famous Castaic wash, the first vehicle through after the heavy storms. The men carried heavy ropes across the pipe-line to throw out to soldiers on the truck if the vehicle dropped into a deep hole

Highway Data Via Wireless

Members of Los Angeles Motor Reserve Corps Tour Over Flooded District to Obtain Road Information



Road information transmitted by field wireless to armory station at Los Angeles from point in the hills 100 miles north on the Bakersfield highway

LOS ANGELES, Cal., Feb. 22—One of the most practical and interesting military demonstrations ever made with a motor truck was conducted in Southern California shortly after the recent storms which damaged Southern California highways to the amount of $30,000.

Los Angeles already is famous for its squadron of the national motor reserve corps. The local motor car and truck men doubtlessly have done more with the gasoline vehicle in the military service than in any other part of the country and some of the demonstrations conducted have attracted the attention of the war department.

Fifteen Men in Detail

Following closely upon the sensational run to San Diego and return with a battery of field artillery, came the tour of Southern California by a light truck, taken from the truck company of the Los Angeles squadron, for the purpose of securing accurate road information, which was transmitted by wireless to Los Angeles from different points.

The truck used was able to travel at 30 miles an hour on the paved highways and went through sand, over washed-out stretches and through washes where the bridges had been carried away. The portable wireless outfit, including instrument board, aerial poles, guy lines and pins and a set of field telephones, was stored in a compartment on the truck, allowing ample room for the fifteen men in the detail.

The driver and one mechanic were from the motor reserve corps and the expedition was under command of Capt. Jesse McComas, National Guard of California, who was accompanied by two officers of the reserve corps who rode in a touring car. There were twelve men from Battery A, First Field Artillery, N. G. C. in the party to operate the wireless and do the military engineering work.

The military truck went over every passable highway of importance, secured accurate road information, and where the roads were found impassable sent men beyond the passing point to secure data which was wirelessed into Los Angeles and relayed to motorists from the armory.

Not only did the efficiency of the truck for scout, advance patrol and engineering transportation duty stand out, but the economy was a paramount feature. In the report submitted by Capt. McComas, it is stated that the truck, carrying the full equipment and fifteen men, could travel 500 miles over roads in the condition in which they were found, on distillate occupying the same packing space and almost the same weight as one bale of hay. The same distance can be traveled on gasoline, according to the captain, that would fill a tank the size of two bales of hay.

In the report, the captain also stated that for the forage of the horses of the battery for 1 year, he could purchase four armored motor trucks.

TRUCKS FOR MILLION TROOPS

Washington, D. C., Feb. 21—It is stated by army officers that army quartermasters now are giving much attention to the equipment of army field and divisional trains. The view is expressed that the field trains that accompany troops should be animal-drawn vehicles, just as they are now, but that in the case of the divisional supply, ammunition and sanitary trains motor trucks should be used.

With that end in view, a canvass has been made as to the resources of the country in that particular. The reports received in response to letters sent out by the quartermaster general to manufacturers of trucks show that in 30 days about 6,200 trucks could be furnished. If the supply were limited to those manufacturers whose trucks have been subjected to practical tests in the army it would be possible to get between 3,200 and 3,400 trucks, which would be sufficient to take care of the transportation of 1,000,000 troops.

Iowa Ready to Buy Cars

Billion Dollars in Cash Paid for Food Stuffs Means Prosperity

DES MOINES, Feb. 19—Iowa, so her people say, never has had a year that was a failure. She has had droughts, rains and other troubles, but has always emerged from the rain of misfortune and shaken off the possibility of failure as a big Newfoundland shakes from his back the water of the pool.

This year is one of those years. The state was hit by an early frost and by a rain which did heavy damage to the corn crop, but because of her diversified industries and resources the state came through 1915 with its usual successful record, and stepped undaunted across the threshold of 1916. And this means—more motor cars.

The Des Moines motor show which was held this week is not one of lamentation over blasted futures; it is a show of promise. The dealers from all parts of the state which are served by Des Moines are looking for an increase and not a decrease in 1916 business.

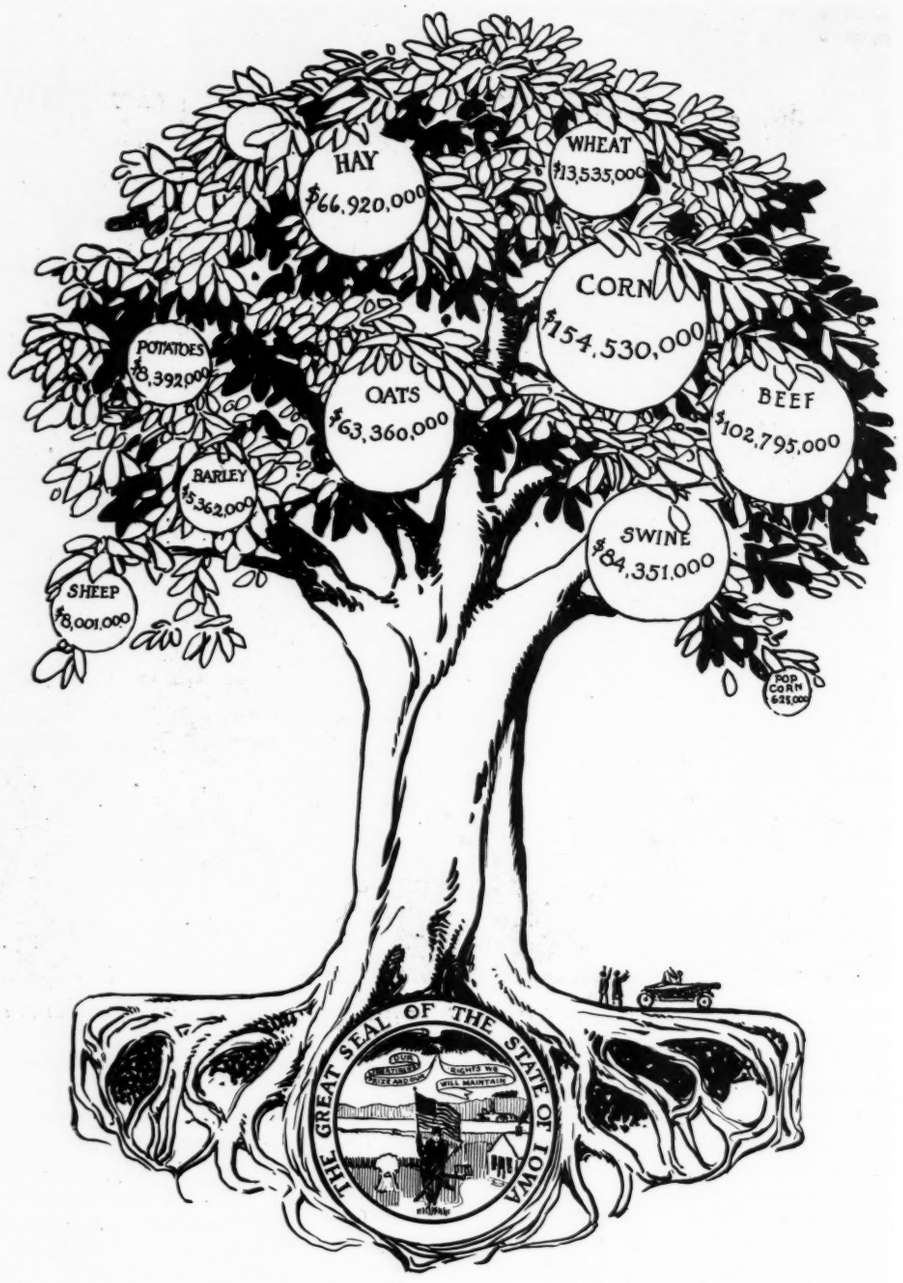
The big distinguishing characteristic of the state is her ever-present market for her products, and this is because those products are foodstuffs. When financial panic puts a damper on business, causes unemployment in industrial centers and mayhap sends the prices of groceries soaring, it is Iowa which stands unshaken through it all, because the world cannot get along without the things she has to sell.

Iowa Leads in Foodstuffs

If Iowa produces shoes, clothes, luxuries or staples which could be done without, her progress would not be so even and unshaken; but her foodstuffs are essential to the existence of the nation and when her people sell, the nation pays—in cash.

The annual production of foodstuffs is estimated at a round billion dollars. Her population is about 2,320,000; this means a production of $431 for every man, woman and child in the state. It means, with five persons in each family, a living of $1,724 a year for each family and enough left over to buy at least a cheap car. Eliminating the big proportion of the city populations, which cannot buy cars, and spreading their pro rata of wealth over the remainder of the state, it indicates a car-buying power that is proportionately enormous.

Lest the calculation may appear chimerical let us state that Iowa now owns one car to every fifteen people, men, women and children. Line the population up in a row and every fifteenth persons owns a car. In Buena Vista county there is a car to every person in nine, and by the end of 1916 the figure will be still more



startling. This is 100 per cent better than the next state.

The per capita wealth of the United States is $1,965. In Iowa it is $3,345. The state has money; and it made a lot in 1915. And, furthermore, the Iowa farmer, with his modern lighting plant, plumbing and other improvements is not averse to buying a car if his year's business warrants it.

With products estimated at $1,000,000,000, the Iowa farmer should be a good car buyer. Of course, a large percentage of the billion will go for living expenses and operation of the farms, but if only 10 per cent of it is used for cars it means $100,000,000 and this means 100,000 cars averaging $1,000.

It probably will not be 100,000, because the normal progress of economics is not subject to such sudden jumps. The following table shows the gains and percentage of gains during the past few years and these must be taken into consideration in estimating for the coming year.

Year	Cars owned	Cars bought	Percentage of gain
1911	27,998	.....	....
1912	44,188	16,190	57%
1913	70,068	25,880	58%
1914	106,087	36,019	51%
1915	145,076	38,989	36%

The decrease in gain from 51 to 36 per cent for 1915 may be attributed to weather conditions. A normal gain, estimated on the three preceding years, is about 50 percent. A 50 per cent gain would be approximately 75,000 cars for 1916. A gain of one-third would be 50,000 cars. With the possible buying power and the percentages of gain of preceding years as a basis, it is safe to estimate that Iowa will buy 75,000 cars in 1916.

There are in the state 2,587 dealers. This means thirty cars to each dealer, and there are some who will sell many more than that. If each sale averages a profit

of $200, which is low, it means a profit of $6,000 for each dealer—provided he gets the list price. And God help him in the coming competition if he doesn't get it. It means $15,000,000 in profits for the dealers of the state.

Corn and hogs are a big product in Iowa. They have said that in Iowa corn is king; nobody has placed the hog on a throne, but if corn is king the hog is queen. The corelation of these two products has helped Iowa through her present year. An early frost and rain hurt the corn; it produced what is called "soft corn," a corn which does not mature and harden in the ear. This might seem to be waste—but it isn't. It is excellent hog fodder if rightly fed. When the weather man said: "I'll spoil your corn," the Iowa farmer answered: "All right, I'll take my profit in pork." When Iowa is blocked at one point she pushes through at another. She won't be stopped.

That is why a 1915 crop of corn valued at only $154,530,000 is not a setback when compared with a 1914 crop valued at $214,183,000. It looks like a loss of 28 per cent—but it isn't. May and July corn are today selling within a few cents of the price of a year ago. Pork products are about $1 lower.

Putting the Pop in Popcorn

Iowa knows her salvation is in a diversity of products. For that reason the state is promoting agricultural study and research. Popcorn is becoming an important crop, 30,000,000 pounds, valued at $625,000 were yielded in 1915. The farmers are scientific. The national government sent a man on a long pilgrimage to learn about popcorn, and it wasn't until he reached Iowa that he found what he wanted to know, which was what puts the pop in popcorn. The pop of perfection is caused by 12½ per cent of moisture in the kernel. And Iowa knows how to put it in, take it out and put it back in again. This is her secret.

Corn is a big crop, of course; so also are oats, wheat, potatoes, hay, barley, apples—which are newcomers—and then there are hogs, the beef cattle, the dairy products and other lesser food products. Iowa's specialty is feeding people.

It is true that the total value of the corn, oats, wheat, hay and barley crops are less by 13 per cent and that the value of the live stock on hand January 1 is 2 per cent less than a year ago, but it is also true that bank deposits increased about $20,000,000 during the year. Some of this money would have bought cars in 1915 had there been cars to buy, but car shortages were the big trouble of the dealers last year. There was plenty of money, plenty of orders—but no cars. Therefore, part of this banked $20,000,000 is still waiting to buy cars, and added to it is the natural production of the year. Herewith follow comparative figures on the leading grains and potatoes and hay:

	1914 AMOUNT	1914 VALUE
Corn (bu.)	363,689,600	$214,183,000
Oats (bu.)	172,696,000	67,650,000
Wheat (bu.)	15,427,280	14,473,000
Barley (bu.)	11,423,310	5,397,053
Potatoes (bu.)	9,540,200	5,533,316
Hay (tons)	5,094,650	52,769,626
Total		$359,995,995

	1915 AMOUNT	1915 VALUE
Corn (bu.)	303,000,000	$154,530,000
Oats (bu.)	198,000,000	63,360,000
Wheat (bu.)	15,557,000	13,535,000
Barley (bu.)	.....	5,362,000
Potatoes (bu.)	15,540,000	8,392,000
Hay (tons)	6,692,000	66,920,000
Total		$312,099,000

Decrease of $47,896,995, or 13 per cent.

As was stated previously, much of the poor corn was used to feed swine and cattle. Beef raising is becoming more and more a strictly Iowa industry. In the past it has been the custom of the Iowa farmer to go into the Omaha market and buy what are called "feeders," cattle which are bought for fattening during the winter and sale about now and during the spring. But the Iowa farmer has had to pay a higher price this past year for feeders and, anyway, he is raising his own feeders. Swine, of course, are an Iowa product from pig infancy up.

Milk cows are not sold, but the state's dairy products are sold all over the world, and this industry is spreading. Horses have been and are being sold for war purposes, and the mule industry is gaining a footing. Some of the $20,000,000 that was banked in 1915 came from last spring's sales of stock, and during the next few months there will be a big income from feeders and swine.

Farming and Boosting

The Iowan is regarded as a farmer. It is true, he does this for a living, but his next biggest occupation is boosting. In not more than 60 seconds after an easterner wandered into the show the other evening he had been told that Iowa is first in value of farm products, value of live stock, value of farm property per farm, in increased valuation from 1900 to 1910, in percentage of improved farm land, in percentage of area in farms, in number of motor cars per capita, in value of horses, in value of cattle, in value of hogs, in number of poultry, in value of egg production, in tonnage of forage crops, in production of corn, in production of oats, in production of grass seed and a few other things too numerous to mention here—but the Iowan mentions them everywhere he goes, and then some.

There is no question but what Iowa is a great state. If in doubt just mention the subject in the neighborhood of an Iowa man and hear him admit it.

Death by Motor Truck with Harmony

Hawkeye Suggests Mail Wagons Be Equipped with Musical Horns

DES MOINES, Ia., Feb. 22—New York has had music with its meals for a long time and an Illinois physician recently suggested that graphophones be used in the operating rooms of hospitals instead of anesthetics, but the recommendation, made by J. A. Whalen of this city, that the motor trucks operated as mail wagons by the government, be equipped with musical horns so that victims, struck by these vehicles, may pass away or suffer to the soothing cadence of harmonious reeds is something else again.

Whalen has made such a suggestion in a letter to Miss Margaret Wilson, daughter of the president, who presided at a recent session of the American Civic Association that went on record in favor of equipping all motor cars with musical horns. He wrote:

"May I be pardoned for asking you to use your influence to have the postoffice department take the initiative by so fitting out its mail trucks?

"A recent second assistant postmaster general, now an attorney for the department, is reported as having said that he did not consider excessive a death rate of 12 from this cause in New York alone. If its standard of efficiency is to be maintained it would appear that a considerable number of persons will have to give up their lives every year beneath the wheels of the vehicles in question, because cars cannot be forced to crawl along at a snail's pace.

"How much pleasanter would be their departure from this life if the trucks could be equipped with vari-toned horns which could blend into such melodies as 'One Sweetly Solemn Thought,' instead of scaring the impaled victim by the raucous and discordant notes now so common."

FEDERAL ROAD BILL TO SENATE

Washington, D. C., Feb. 19—To the senate committee on postoffices and post roads finally has gone the Shackleford good roads measure passed in the house of representatives by a vote of 281 to eighty-one. Just what action will be taken by the senate committee is not known.

Opinion at the moment in Washington is divided as to whether this means as favorable a consideration of the bill as seemed to be assured at the hands of the committee on agriculture, to which the measure first was referred. Senator Gore, of Oklahoma, in a bill of his own is squarely on record for a comprehensive federal policy in roads, and his fellow committeemen in great degree shared his views. Senator Sheppard, of Texas, has a draft which contains much of the house bill.

Dean Talks V-Type Engines to Philadelphia Engineers

Pennsylvania Section of S. A. E. Hears Twelves and Eights Discussed in Organization Meeting

PHILADELPHIA, Pa., Feb. 16—The organization meeting of the Pennsylvania section of the Society of Automobile Engineers was held here tonight at the Engineers' Club. The first action taken by the new section after it had been voted that a permanent organization be made, was to elect the temporary chairman, E. S. Foljambe, the temporary secretary, B. B. Bachmann, and T. Y. Olsen, temporary treasurer, as permanent officers to serve until the end of the administration year, October 1. In addition, W. M. Newkirk was elected vice-chairman and W. H. Palmer, Jr., as held-over treasurer. This is in accordance with the constitution and by-laws as recommended by the council of the S. A. E. and which were also adopted by the Pennsylvania section.

A. M. Dean, engineer the Ferro Machine & Foundry Co., read a paper on the development of the eight and twelve-cylinder V engine in which he particularly alluded to the development of his concern and outlined the considerations back of this development. In opening his paper he referred to the typical American as compared with the typical European design stating that the American motor carries the valves in the head while European practice favors the L type, the American motor uses individual cams while the European employs the same cam for opposite cylinders. Another point of difference is in the unit crankcase on American motors while foreign practice inclines towards the employment of a separate cast aluminum crankcase.

Development of Overhead Valves

Taking up the motor part by part, Mr. Dean first dwelt on the development of the overhead-valve construction showing how the advantages of good combustion chamber shape had been maintained while the objections of large and heavy parts which tended to become noisy had been eliminated. Speaking of the use of the offset rocker, he showed its great advantage in the high-speed motor because it allows advantageous cam shape and at the same time gives quick opening of the valves with a minimum amount of travel of the parts. As an example of the successful use of the offset rocker, the number of years of satisfactory performance of the Franklin valve system was cited by Mr. Dean. Throughout the entire consideration of the valve question, Mr. Dean brought out the fact that the high speeds at which motors are now operated have thrown into position of relative importance the details which were formerly regarded as being unimportant.

A good example of careful detail as brought out in the paper is in the threaded pin adjustment for valve clearance. This governs the position of the pivot point of the rocker arm and has the great advantage that the adjustment parts are stationary, permitting adjustment of the clearances while the motor is running. Another detail which is of relatively great importance, is in the design of the connecting rod bearings. The rods are so arranged that the bearing split is horizontal and the reason for this is found in the method of firing across the blocks giving a resultant which makes it necessary in order to secure the best distribution of materials and stresses that the division of the bearing be in a horizontal plane.

Taking up the question of oiling, Mr. Dean again contrasted European practice with best American practice. He said that a great many engineers in this country had blindly followed the DeDion system of having high pressures with a short registering interval between the crankshaft opening and the oil lead in the main bearing. He stated that he had found it better practice to use lower pressures for the oil with a longer register in order to feed the oil in proportion to the bearing loads.

A motor operates at its maximum efficiency, according to Mr. Dean, when the jacket temperature is at about 170 degrees. In the experiments carried out by the Ferro company with the overhead type of V motor, the author stated that the waterjacket temperature never went over 200 degrees and rarely reached that point except under the most adverse circumstances. In laying out the waterjacket it was pointed out that the water passage should run between adjacent cylinders leaving no blocks of uncooled metal in the casting.

As regards balance, the system used by Mr. Dean is to apply a counterweighting system in which each throw or unit is considered separately. For the eight-cylinder motor this means a four counterweight balancing arrangement, and for the twelve-cylinder motor an eight weight arrangement. The added weight to a crankshaft due to this system, he said, ran to about 34 pounds giving a total weight for the shaft of 84 pounds, but he then went on to show that the evils which may arise from unchecked centrifugal force were far more serious than added weight to the crankshaft, and the use of the counterbalancing system is fully justified by results.

Coming to the respective fields of the eight and twelve, Mr. Dean gave an answer as to where the twelve took up the work and where the eight left off. He stated that the minimum diameter for a cylinder should be 2⅝ inches. Below that there is trouble due to leakage past the rings and difficulty in securing good piston fits. Not only these conditions arise, but poor thermo efficiency also results from such small diameters. This statement of Mr. Dean's he checks up with the experiences abroad which have gone to show that 75 millimeters is the limit for efficient motors. Even taking this bore as the limit, he showed that the smallest twelve is still a large motor. Mr. Dean went on to state that the unbalanced forces in an eight are 1.4 times as large as those in a four, and this naturally immediately limits the size of the eight. With the small bore and light parts the vibrations are so cut down that they do not become serious until the upper limits for eight-cylinder size are reached. This upper limit he sets at 3¼ inches, with a stroke bore ratio of 1.4. This gives a piston displacement of just under 300 cubic inches. The upper limit for the twelve is only the limit of the chassis, and the lower limit would be about 250 cubic inches. Therefore, the field of the eights, in the author's opinion, ranges from 160 to 300 cubic inches, and of the twelves, from 250 cubic inches up.

Discussion of Paper

In discussing the paper, B. B. Bachman, engineer of the Autocar Co., asked if difficulties are not found in the block-cast motors if the water jackets are not extended far enough below the piston travel. Mr. Bachman pointed out that the juncture of the waterjacket with cylinder wall created a vertical ring of metal around the cylinder which restricts its expansion at that point because of the amount of unheated metal. To this Mr. Dean replied that such a ring of metal exists and if it is not carefully placed so that the jacket is below the piston travel seizing troubles are sure to be encountered. For this reason it is the practice of the Ferro company always to extend the waterjacket well below the piston travel.

J. E. Schipper discussed the comparative merits of the side by side and V rod, stating that although the bearing area in the forked rod is greater than that in the side by side design, the advantage of the latter as regards repair work is so marked that it is well worth while to use it if life is not sacrificed. Another point brought up by Mr. Schipper is that in starting the motor with the aluminum pistons since the clearances run up as high as .006 inches unless special provision is made, oil is sure to accumulate in the combustion chamber during the first few strokes.

Thomas to Drive Here

Winner of 1914 Hoosier Classic Plans Another American Invasion

Switches Allegiance from the Delage, Securing Peugeot from Maker

NEW YORK, Feb. 22—At least one foreign driver of renown will participate in the 300-mile international sweepstakes to be run at the Indianapolis speedway.

According to a cable received from France last week, Rene Thomas, winner of the Hoosier classic in 1914, is planning another American invasion and has secured a Peugeot for his 1916 campaign in the U. S. A. This arrangement marks a change of allegiance for Thomas, who, in his last appearance in this country, was at the wheel of a Delage.

Thomas is one of the few French stars that are not driving military cars or serving in the trenches. At the outbreak of the war, he thought that his experiences as an aviator and an expert driver would qualify him for a place in the French army. He offered his services again and again, but because of a motorcycle accident that kept him in the hospital 12 months when he should have been receiving military instruction, the army refused to look upon him as an eligible candidate. Finally, disgusted at the red-tape proceedings, he took charge of a shop and for the past 18 months has been engaged in offering first aid to military motor vehicles rendered hors de combat by German shells and convoy accidents.

PHOENIX MAY TURN OUTLAW

Phoenix, Ariz., Feb. 22—Whether there shall be motor racing at the state fair next November under the sanction of the A. A. A. is the subject of a lively controversy in Arizona and as a result, the fair commissioners and George Purdy Bullard, Arizona representative of the association, who for years has superintended the speed events, are at loggerheads.

The commissioners met recently and decided not to offer any big purses to attract racing stars from outside the state. Heretofore the crowd on "motor day" at the fair has been at least twice as large as on any other day, but the commissioners, two of whom are new appointees, took the view that the money paid to bring Oldfield, Cooper and other famous drivers had been largely wasted. They argued that there would be just as big a crowd out to see Arizona drivers in competition.

Later the commissioners decided to go still farther and not incur the expense of securing an A. A. A. sanction. Bullard immediately declared that if outlaw races were held, the track would be blacklisted by the A. A. A. and that there never would be any more races worth while in Phoenix. He reminded the commissioners that had it not been for the crowd which packed the grounds on "motor day" of the last fair, the show would have closed with a huge deficit instead of a small surplus.

Tom Shaughnessy, secretary to the commission, says that the plan is to stage motor races under the auspices of the International Motor Contest Association. He complains that the A. A. A. has been domineering in its methods.

PICKENS FOR SPEEDWAY MANAGER

Omaha, Neb., Feb. 21—Bill Pickens, who had a fine Italian hand in the making of Barney Oldfield famous, now is being sought by local race promoters as the manager of the Omaha speedway and if the deal goes through, Pickens will be in charge of the two contests to be staged on the 1-mile track here this season. The opening race is scheduled for July 15 and the second meet will be run during the week of Ak-Sar-Ben, Omaha's annual carnival, in the fall.

TOWN NAMED AFTER VELIE

New Orleans, La., Feb. 21—They have named babies and cigars after the presidents of the United States, but the first town in the country to adopt the name of a motor car for its corporate title is Velie, La., a small settlement north of Shreveport that has been given a postoffice by the government. At a meeting of the citizens to effect a permanent organization, many meaningless names for the town were suggested and the discussion waxed warm until an enthusiastic Velie owner suggested that the community be christened "Velie." The name was endorsed by several other Velie owners present and unanimously adopted. Uncle Sam promptly gave his O. K. to the postoffice petition and Velie, La., now is on the map.

FISK SALES TOTAL $14,500,000

Chicopee Falls, Mass., Feb. 17—Sales for the fiscal year of $14,500,000 with net profits of $1,791,579 were reported at the annual meeting of the Fisk Rubber Co., held here yesterday.

On account of insufficient time action on the authorization of additional capital stock was not taken up and the meeting was adjourned until March 8 for action on this question. The present capitalization is made up of $5,000,000 first preferred, $2,000,000 second preferred, and $8,000,000 common.

The regular quarterly dividends of 1¾ per cent on the preferred stock, payable May 1 and on the second preferred stock, payable June 15 were declared.

The officers and directors were re-elected as follows: President, H. T. Dunn; vice-president, E. H. Broadwell; chief engineer, John Kearns; sales manager, J. D. Anderson.

Ascot Race Postponed

Los Angeles Track Not Completed in Time for 100-Mile Contest

Fifteen Cars Are Entered to Date in Inaugural Event Sunday

LOS ANGELES, Cal., Feb. 22—The Washington's Birthday handicap, the inaugural race to be run on the reconstructed Ascot Park speedway, originally scheduled for this afternoon, has been postponed until Sunday, February 27, as the course will not be completed until tomorrow.

The surface of concrete-asphalt needs another day to dry but the contractors say that the course will be open for practice by Thursday, which will give the drivers three days in which to learn the track and warm up their cars before the starting bomb sounds for the 100-mile struggle.

Fifteen entries have been made to date but the promoters are confident that at least twenty cars will be on the starting line Sunday. The following nominations have been made:

Car	Driver
Peugeot	Burman
Duesenberg Cyclone	Hill
Stutz	Cooper
Mercer	Pullen
Sunbeam	Hughes
Mercer	Lewis
Duesenberg	O'Donnell
Stutz	Parsons
Omar Special	Toft
Durant Special	Durant
Gordon Special	Elliott
Romano Special	Lentz
Milac	Teddy Tetzlaff
Tabais	Shockley
Apperson Special	Price

Barney Oldfield will not compete in the 100-mile race but will go after the mile record with the front-drive Christie. Barney is backing the entry of George Hill, his former mechanician, with the Duesenberg Cyclone.

THREE MEETS AT TACOMA

Tacoma, Wash., Feb. 23—Three series of racing events for this season are announced by the Tacoma Speedway Association—the first on Memorial day, the second on the Fourth of July, and the third and richest contest to be staged in the Pacific Northwest, the Montamarathon, August 5.

Coupled with this announcement was the further one that F. Garrett Fisher has been elected president of the association to succeed Frank Allyn, resigned on account of ill health.

A number of short events featuring northwest drivers, will be staged on Decoration day, where the feature will be a 100-mile event. The Montamarathon will be for a purse of $10,000, with a bonus to the driver finishing the first 100-miles in the best time, and a like bonus to the man finishing the 200 miles in the best time. The distance will be 300 miles instead of 250 miles, as formerly.

An Ambulance Driver's Life at the Front

By Hi Sibley

American ambulance "looks pleasant, please" before a windmill on the Belgian road between Crombeke and Vleteren

THERE is no monotony in the life of an ambulance chauffeur at the front. The events of any one of his days would be sufficiently thrilling to make a complete story. His path is beset with shells, suspense, germs, broken springs, skeptical sentinels, aeroplane bombardments and—tragedy. Daily he comes face to face with human suffering in its most hideous forms. He carries it in his ambulance; he encounters it at the field hospitals. He hears the shrieks of some poor mangled wretch every time he passes a hospital, and he lives in an atmosphere sickening with anaesthetic. He cannot get away from it.

And these are things I do not like to recall. However, that you may know something of the nature of the work of the American ambulance squad in Flanders, I will briefly cite a few specific instances.

It is nine o'clock in the evening and the members of the squad are grouped about one of the cars, smoking and recounting their experiences of the day or watching the flashes of the rockets over the trenches a short distance to the east of us. The intermittent crack of musketry and boom of artillery is distinctly audible.

Comes a messenger with a slip of paper in his hand; it is an order from the medecin-chef, or chief surgeon of that section, and calls for one car to get a "couché" or stretcher case from a post secour (first aid station) just back of the lines, to be transported to one of the field hospitals. Being next in order on his list, our chief sends me on the errand.

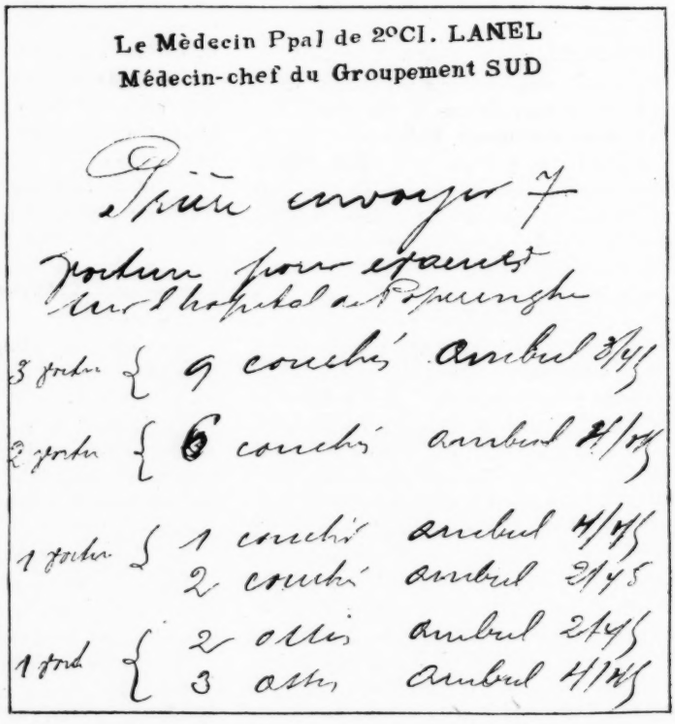
It is a dark night, a slight drizzle, and no stars are showing. I am not allowed to light even my side lamps on account of the proximity of this particular post to the German lines. The road, though familiar enough, is not the best, and as I draw near the post its condition becomes worse. Gaping "marmite" holes yawn before me unexpectedly, and I must pick my way with great caution, for to slip into the red clay at the side might spell disaster.

Presently I arrive at the post and back my car around to receive the "blessé," as a wounded man is called in France. Four stolid brancartiers, or stretcher bearers, carry out the groaning man from the dimly lighted post. They gently slide in the stretcher, head forward; the tail gate is closed, rear curtains fastened, and I start back to the hospital. The flashes of the trench rockets, like lightning of a rapidly approaching thunderstorm, weirdly light up my way, but progress is difficult on account of the alternate blinding glare and Stygian darkness. In one of the intervals between flashes my front wheels drop into a deep rut with an abrupt jolt and my wounded passenger moans piteously, "Doucement, s'il vous plait, doucement!"—"gently, please, gently!"

Moans, Jolts and Darkness

We creep ahead slowly, but it is impossible to avoid an occasional jar and each one evokes a cry of pain from the blessé. It is nerve racking work, covering those 3 miles to our destination. And as we draw near the hospital, we are greeted with the agonized cries of blessés who had preceded us to the operating room; they chill the blood. It is not a cheerful welcome for my passenger. Suffering with a badly shattered leg—a shell wound—he is carried at once to the operating table, but I leave before he is given further attention. I do not care to see nor hear any more.

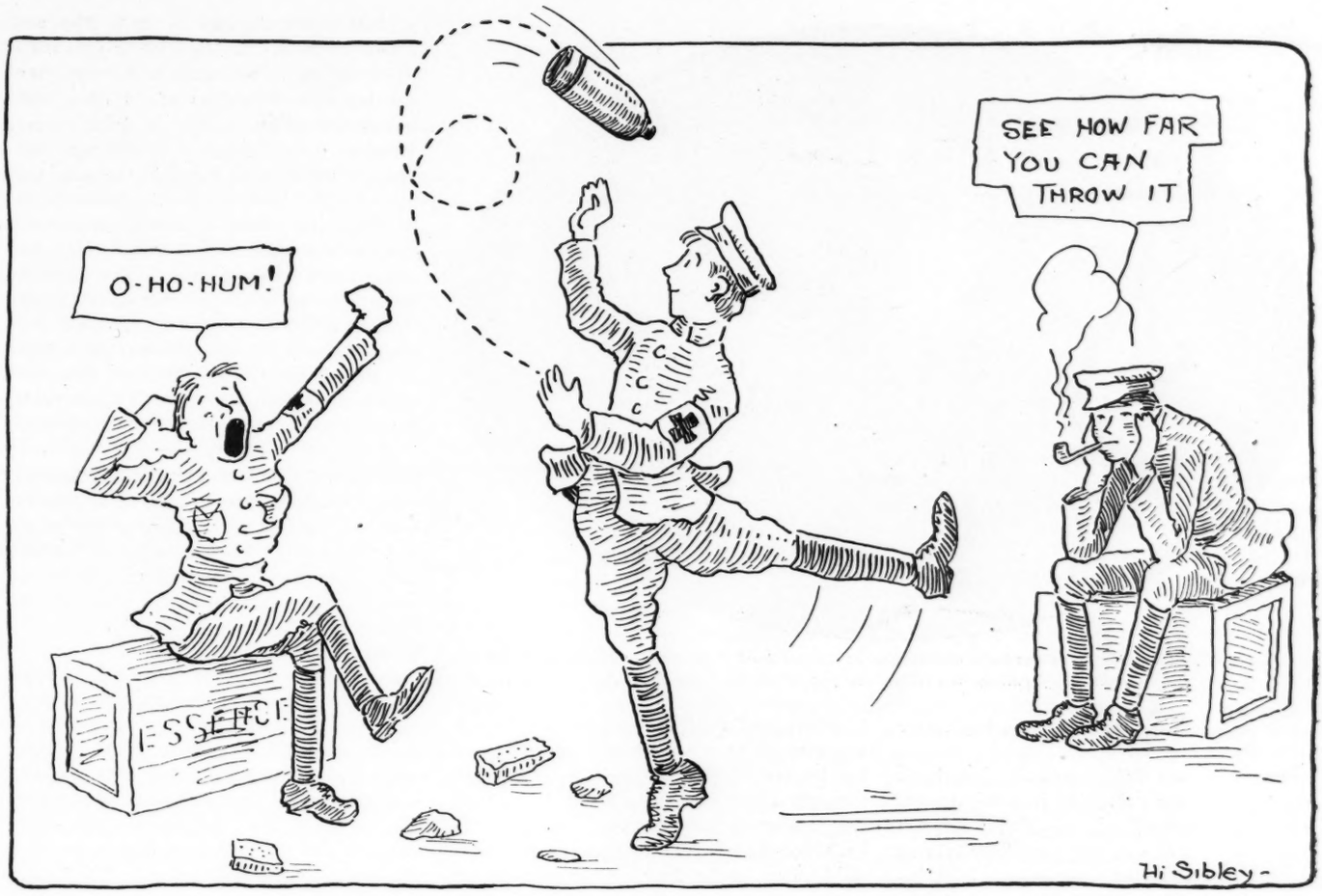
Now that is only one case. Such things are daily occurrences, daily occurrences, mind you, when there has been no concerted attack, when the official communiqué reports "all is quiet along the Yser." After an attack such tragedies are increased a hundred-fold. Well I recall one night the British made an advance in the



Le Mèdecin Ppal de 2°Cl. LANEL
Médecin-chef du Groupement SUD

Prière envoyer 7
Voiture pour évacuer
Hôpital de Poperinghe
3 voitures { 9 couchés Ambul 3/45
2 voitures { 6 couchés Ambul 2/45
1 voiture { 1 couché Ambul 1/45
2 couchés Ambul 2/45
1 voiture { 2 assis Ambul 2/45
3 assis Ambul 1/45

Facsimile of order from chief surgeon for seventeen cars to transport twenty-three wounded men to the evacuation hospital at Poperinghe



"In particular, I recall the night that 'Hash' Gill, former Princeton fullback, executed some fancy juggling with a German 77 shell, which one of the boys had picked up, rusty, mud-covered and minus the fuse cap"

vicinity of Ypres. This was southwest of us, perhaps 6 or 8 miles, but from midnight until seven in the morning the terrific roar of their guns shook the very rafters of the old barn in which we slept. It seemed that they must have hurled hundreds of thousands of shells at the enemy to break up their lines. And we knew that there would be work a-plenty for us in the morning.

An Urgent Ambulance Call

And there was work. At eight o'clock, we received orders to send every available car—there were seven in the squad at that time—to remove every convalescent who was able to be moved, to Poperinghe where they were to be sent to the interior. This was to make room for the thousands of newly wounded in that advance. Each car had to make several trips. At that time I happened to be assigned to a big Renault, presented to the American Hospital by Claus Spreckels, which carried double the capacity of our other cars.

That first trip will always remain vivid in my memory, for no sooner had we started than the Germans took it into their heads to shell Poperinghe, where many British soldiers were quartered. And there were ten men in my car, ten "assis," or sitting cases, besides Donald McGibeny, of Indianapolis, who was to take over the Renault after I left the squad. It was no pleasure jaunt. Moreover, it was a ticklish job handling that car, for the slots in the transmission quadrant (four speed progressive) were so badly worn that the gears were continually slipping out, and on top of this an infantry captain sitting beside me with a stiff leg kept his injured foot under the clutch pedal most of the time. On account of his rank and condition I couldn't gracefully kick it out under stress of the moment and in consequence manipulation of the clutch pedal was rendered very difficult. When one is under fire, particularly big shell fire, he doesn't fancy having any obstacles in the way of operating his car with speed and dispatch.

Shells Speed Up Journey

Just as one enters the town, there is a steep, narrow, winding grade, and we took this about as fast as we could and still remain right side up. Through the town we shot, past scurrying soldiers, sentinels, artillery trains and transports. At the evacuation hospital was a line of British ambulances, two squares long and waiting to discharge their miserable burdens. There was hurry and bustle everywhere, punctuated by the heavy reports of bursting shells back of us. We were relieved of our load after tedious waiting and prepared to start back through the zone of fire. I was for taking another route, but McGibeny, who announced that he was somewhat of a "fatalist," urged me to return the way we came, which I did, and just as fast as that Renault could carry us.

Without exception, the most trying of all our work was transporting the seriously and the mortally wounded. Often the slightest jolt would cause them to shriek out in agony and it was no easy matter to avoid jolts in the rough Belgian block pavé. At times we barely crept along. Once I took a French captain, who was at the point of death, 7 miles in the Renault on first speed. The journey consumed half the morning. That captain had been a handsome man, but now his eyes were sunken, his skin drawn tightly over his bones and his black lips were parched and cracked with fever. He pleaded for water every foot of the way, but I had no water to give him, for all the water in that section is so polluted and slimy that one hesitated to use it, even boiled.

Die En Route to Hospital

Frequently the blessés are so far gone that they die in the car before a hospital can be reached. Paul Haney had a distressing experience under fire with a stretcher case in his ambulance. Right on an exposed stretch of road he had a blowout, and while changing the tire his blessé died. One in Campbell's car, crazed with pain, shot himself through the head. I have carried any number who had no visible wounds whatever, but who had gone mad from the terrific concussion of burst-

Taking wounded soldier from author's ambulance at hospital at Zuydcoote, near French-Belgian frontier, formerly a sanitarium for tubercular children

ing shells. They are the most pitiable wretches I ever have seen.

Scenes in the field hospitals, just back of the lines, are grewsome in the extreme. As a daily sample, one morning I stepped into No. 245, one of the four hospitals at the little village of Crombeke. Just inside the open door, on the operating table, was a young man helping support his own leg while it was being amputated above the knee. He was looking on, dumbly, though of course the member had been treated with local anaesthetic. On another visit, there was a Zouave on the table, just up from the trenches, who had not been given previous first aid. His leg had been blown completely away below the knee and the stump had gotten down in the mire. Four men were required to hold him, screaming at the top of his voice, as the surgeon picked the clotted mud from the splintered bone. Probing for shrapnel was an every-day sight; all of it was an every-day sight, but I could not grow callous to it.

Sleep on Couch of Death

But enough. Our life in camp was not so tragic, though it had many discomforts. Sometimes we slept in makeshift tents, or on stretchers in our ambulances. Perhaps the car had carried a contagious case the same day and had not been fumigated. We never knew how many men had died on the stained stretcher that formed our couch, but usually we were worn out at night and did not think of such things. Ferguson and I enjoyed the height of luxury in the Renault which we fitted up as a dormitory at night and called the "Ritz." We secured two new, clean stretchers and suspended them on springs from rods in the car, hung up a side-lamp, arranged a board for a table, and spent the rainy evenings there, wrapped in our blankets and reading the sketchy French newspapers or such current literature as the Strand Magazine for 1902, which was the only thing we had in English. I recall the advertisement of the little curved dash Oldsmobile in its pages, so you have an idea of about how recent our library volumes were.

Scissors for Rubber and Hair

If the nights were unusually cold and rainy, we slept in barns. The barns, however, were not particularly inviting, for invariably there were other guests, some four-legged ones and others with a dozen legs, and they kept us as busy as O. Henry's "one-armed paperhanger with the hives." At Crombeke these little playmates became so chummy and inquisitive that I had to soak my blankets in gasoline and keep a club handy to discourage their advances.

Facilities for sartorial improvement were rather limited, too, though I confess that this didn't bother us greatly. We cut one another's hair with a rusty pair of scissors, which at other times were employed in making blow-out patches from discarded inner tubes. Our hair cuts had a thatched roof effect in consequence. There wasn't a bath tub within 20 miles of us, but we accomplished the necessary by sousing one another with canvas buckets of water, and it was mighty cold water, too. I tried to improve on this system by heating some water in a can with a blow-torch, but I only got about enough to moisten one ear, and went back to the original, if somewhat shivery, practice. It seems to me that we did have a comb at one time, but I believe it got lost in the early part of the season.

We flirted with germs all summer long. Before leaving Paris for the front each volunteer is required to be vaccinated against smallpox and to take the anti-typhoid treatment. This latter consists of three injections of serum under the shoulder blade at intervals of 10 days. The immediate effect is like a kick from a Missouri mule, though if I had my choice again I would take the mule, because then I could get back at him. However, the preventative must be efficacious, for in spite of the risks we took, none of our men came down with typhoid. For instance, the water being so bad we drank a thin Belgian beer; even brushed our teeth with it. Belgian beer and French tooth paste, by the way, is a combination that will knock your hat off. We had innocently been drinking this beer for a fortnight (not steadily, however) when the medecin-chef casually informed us that it was alive with typhoid germs of the most virulent sort, and that many of the soldiers had the fever. He closed up all the "estaminets" or cafés in the village on that account. Singularly enough, none of our boys were taken sick.

Satisfying the Inner Man

Our meals were not prepared in what would be regarded as hygienic environment in this country, though the food, as a rule, was of good quality. An old Flemish woman—I am speaking of Crombeke, where we were stationed most of the summer—cooked for the entire squad of twenty over an odd little one-hole stove exposed to the weather and flies—there

A night spent in a Flemish barn is not always conducive to rest

Resourceful ambulance driver preparing his Saturday night bath

were millions—and things. Our plain board table was set out under a tattered burlap awning which protected us from a sun that never came out and collected the rain in such a manner as to direct large streams upon favored heads of the party. At one side of us was a corral of gaunt Belgian hares and on the other a malodorous and flourishing family of pigs. The latter were concealed (from view only) by a thin canvas partition, probably so as not to embarrass the pigs. One old porker, however, did nose his way out one noon, but after a supercilious survey of the party, he gave a grunt of disgust and retired to his own more attractive quarters. We were fortunate to have substantial American appetites.

For amusement during leisure hours, we were left pretty much to our own devices, for a colonel quartered in the village issued an edict that all cafés—there were only four about the size of a flat parlor—should be closed at eight in the evening, and that the American ambulance men in particular should be at their barnyard camp after that hour. This permitted us an hour, however, in one of the cafés after dinner, and we usually repaired to the only one which boasted a piano. It was not an instrument to boast of, for that matter, but McGibeny, an able entertainer, managed to whack out a near approach to music, and a few minutes after he began his concert the little café would be filled to overflowing with Zouaves, Belgians, Arabs, French Fusiliers and an occasional British Tommy. In compliment to us the French sang "Tipperary" in English—pronouncing each syllable distinctly and slowly—and then we sang the "Marseillaise" in French, that is, our conception of French, which would be roundly applauded, and then we would pass the cigarettes. A pleasant time was had by all, as the society editor of a small town paper writes.

In camp each one rode his own pet hobby. Victor White was our official photographer, an artist in that line, by the way. He fitted up his car as a dark room and developed and printed pictures on the spot, experimenting with all sorts of paper and getting many excellent results. Ned Townsend, when he wasn't trying to take a close snapshot of a bursting shell, directed his attention to collecting souvenirs, and most of the time was surrounded by a group of Zouaves or Marines with whom he bartered for aluminum rings, guns, helmets, shell noses and anything he could get in the way of war trophies. He had perhaps the most complete collection in the squad. Fay took great interest in keeping his car tuned up to the top notch, with the result that he had the smoothest-running and best-equipped car out of the twenty. Brenner was an omnivorous reader and perused everything from the Ford "bible" down to labels on tobacco tins. Reading matter was preciously scarce, and when by chance a paper did come from the states it was torn to pieces and apportioned among the clamoring crowd.

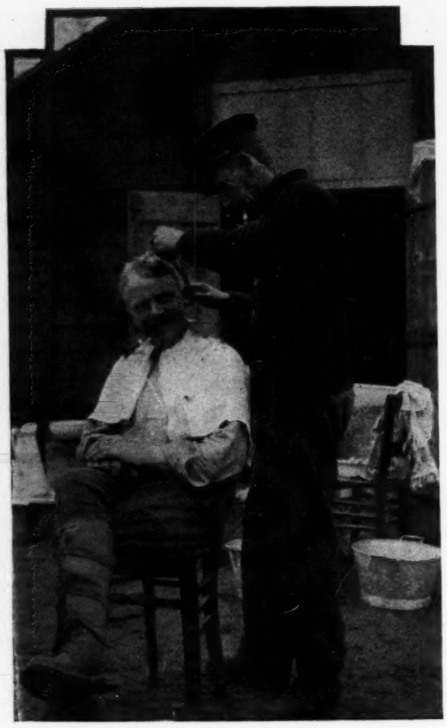
Theatricals at the Front

To vary the monotony we put on an occasional variety show, with numbers running mostly to songs and feats of strength. In particular I recall the night that "Hash" Gile, former Princeton fullback, executed some fancy juggling with a German "77" shell, which one of the boys had picked up, rusty, mud-

A famous car, a Renault ambulance assigned to the author, and a famous pig, captured from the German trenches by a soldier in the foreign legion who escaped unhurt with his grunting booty. The illustration was taken in a barnyard of Crombeke, Belgium, where the American ambulance corps did all of its repair work. In the barn, shown in the background, the drivers and mechanics slept on cold nights

covered, and minus the fuse cap. Doing his stunts, Gile dropped the shell frequently and the sparks would fly as it struck a stone or piece of scrap metal on the ground. The next morning an artillery officer sauntered into camp and spying the shell near one of the cars, wanted to know what in the world we had that thing around with us for. We told him it was one of our playthings, whereupon he informed us that if we loved life we had better dispose of it at once, for the shell was loaded, and very sensitive, and liable to go off at a very inopportune moment. A French infantry captain, he said, had merely turned a similar shell over with his foot once, when it exploded and blew him into eternity. Our plaything was promptly buried, and at a great distance from the camp.

Considering the many narrow squeaks we had, it seemed that our boys bore a charmed life, for during my service with them not one was wounded or injured in an accident, and the only case of sickness we had was traced to eating too much fresh pork, which appeared on our table nearly every day. And in spite of our discomforts and mild hardships, most of us gained in weight. Our experience was something like that of the optimistic Zouave, who said that he had one thing to thank the Germans for, that by forcing him to live like a savage in the open they had added 10 years to his life.



Stebbins, an American volunteer, getting a war zone haircut, in an improvised tonsorial parlor at the front

British Car Imports Break Records

Exports, However, Show Loss of 35 Per Cent

LONDON, Feb. 10—Motor car import and export statistics just published by the British government are interesting on account of the comparisons they allow between the war and the pre-war periods. For the 12 months ending December, 1915, England has imported a greater number and a greater value of cars than in any period of her history. The actual number of complete cars and chassis brought into the country was 20,546, but of these 754 were re-exported, leaving a net import of 19,792.

For 1913, the net imports—making the deduction for re-exports—was 12,993; the figure was practically the same for 1912. The value of these imports for the year 1915 is $37,821,680, or $42,065,920 if the re-exported cars are considered. Taking the gross import figures, which includes cars remaining permanently in this country and those re-exported to the colonies or other foreign countries, the increase for the 12 months is 26.29 per cent.

British exports show a loss for the 12 months of 35.69 per cent, the figures dropping from $19,741,715 in 1914 to $12,695,955 in 1915. It is necessary to go back to 1910 to find such a low figure.

The British statistics do not deal with the motor trucks which were bought direct by the army, authorities in America and elsewhere, and imported by them, or those trucks imported by dealers and afterwards sold to the government.

The re-export figures are decidedly low, the number of cars and chassis coming into Great Britain for transit to other countries being 754 in 1915 against 1,785 in 1914. This business has dropped back to the position it occupied in 1908. This is explained by the fact that most of the re-exported cars came from France and other continental countries, and were sent through England in order to get better shipping rates, or because colonial agencies were held by English firms. This business has been entirely stopped since the outbreak of the war, by reason of all continental motor car factories being engaged on munitions.

The value of imported parts shows less change than the value of complete cars. This is explained by the fact that while few parts have come from the continent of Europe, there has been an increase of cheap American cars, such as the Ford, which are brought in a knock-down condition and classed as parts. Since 1913 the authorities differentiate between car parts and tires. Thus in 1913 the value of imported tires was $11,620,775, while in 1915 it had dropped to $7,120,845. If re-exports are included in these figures, the drop is considerably less, for England sent more foreign tires out of the country in 1915 than in 1913. This is doubtless explained by the fact that England received American and French tires and then shipped them to Russia and other countries engaged in the war.

The author poses for a picture with a squad of French infantrymen and an Arab trooper, Ali Babba

HARNESS MAKERS ARE HIT

Harrisburg, Pa., Feb. 22—Harness manufacturers in this section of the state, who at one time carried on a thriving business, are feeling the effect of the steady increase in the number of motor cars and two large concerns at Wellsville, York county, have been forced to make changes in their business to meet the existing conditions. The Wellsville Mfg. Co., one of the largest manufacturers of flynets in the United States, now is converting a portion of its plant into a shoe factory.

The Harrisburg Leather Products Co., of Harrisburg, has leased a portion of the

plant and now is installing machinery for the manufacture of baby shoes. The shoe factory will employ about 150 persons.

The Wellsville Mfg. Co. was organized in 1893 with a capital stock of $50,000 and gave employment to a large number of persons. Its product of fine leather driving nets, leather and cord nets for work horses and cotton mesh nets was turned out in large quantities and shipped to points throughout the United States, Canada, Germany and other European countries. With the increased number of motor cars and the little use for horses, it is said there is a noticeable decrease in the demand for nets.

CHANGES IN MOTOR LAWS

Savannah, Ga., Feb. 20—Several radical changes in the motor laws were made in the motor vehicle act at the recent special session of the leigslature, and motor car drivers will have many new things to learn in order to comply strictly with the law.

The state law has no effect on municipal laws not in conflict, but sets a state speed limit of 30 miles an hour, with due regard to width, grade, traffic and common use of the highway. Ten miles an hour is the limit on curves, bridges, railroad crossings, deep descents, etc.

A provision of the law, applying both to motor cars and motorcycles, and based on laws previously in force in several cities, prohibits the passing of any street car, interurban or other passenger train while the same is standing still for the purpose of taking on or letting off passengers.

The provisions requiring the driver of a motor vehicle to slow down or stop when signalled by the driver of a horse-drawn vehicle and requiring motor vehicle drivers to slow down and give warning by their horns when approaching horse-drawn vehicles, are included in the act.

Any violation is made a misdemeanor.

FEW GOOD ROADS IN U. S.

New York, Feb. 22—Less than 10 per cent of the roads of the United States are dependable for the all-year-round use of motor vehicles, according to S. M. Williams, sales manager of the Garford Motor Truck Co., Lima, O. That concern, under the leadership of Mr. Williams, and at its own expense, started a good roads campaign at the beginning of 1915, which has already resulted in the appropriation of many thousands of dollars for road improvement. The company has published many educational pamphlets showing the advantages of good roads and giving testimonials of the work which the Garford concern has already accomplished.

It has just written letters to all the manufacturers of passenger cars and motor trucks in the United States, asking for cooperation in good roads work. This will benefit not only the users of motor vehicles but themselves as well, because there will be a greater demand for motor units of all kinds when the 90 per cent of the roads, now impassable for the greater part of the year, are made fit for continuous all-year use.

The figure of 10 per cent of improved roads in this country was secured from the 2,565 answers received to a series of 3,440 letters sent to dealers in passenger cars and motor trucks all over the United States. Of these, 906 reported that roads in their territory were impassable for 25 to 50 per cent of the year; 574 reported from 50 to 75 per cent of the year, and 167 from 75 to 100 per cent.

GOVERNMENT ASKS TRUCK BIDS

Washington, D. C., Feb. 22—The secretary of the treasury, through the general supply committee, has sent out an invitation to gasoline and electric motor truck makers and dealers to submit bids, March 6, for furnishing the executive departments and independent government establishments in Washington with a quantity of trucks during the next fiscal year, beginning July 1. The gasoline trucks will have a capacity of 1,000, 1,500, 2,000, 3,000, 4,000 and 6,000 pounds. The electrics will have the same capacity. Rigid specifications have been drawn for the vehicles.

BRITISH MOTOR CAR IMPORTS

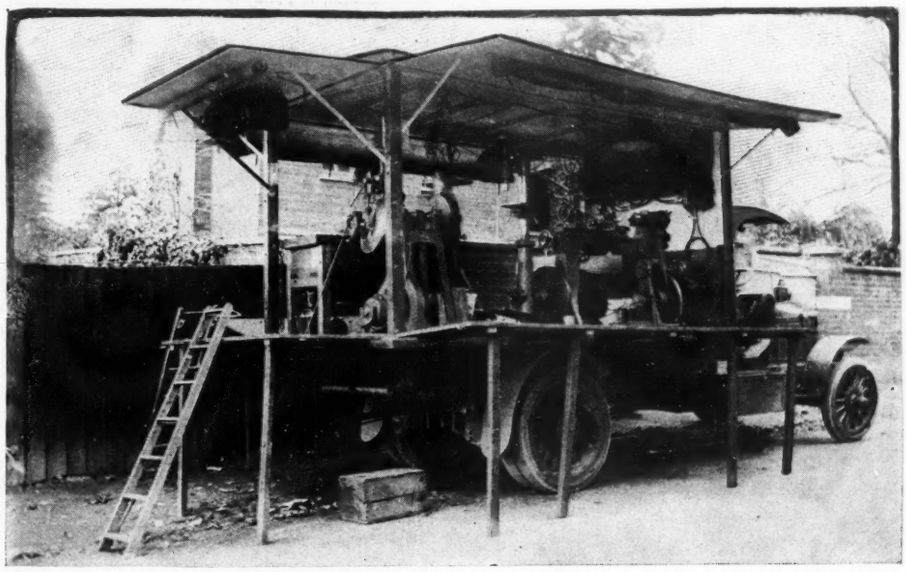
Year	Cars and Chassis	Value	Value of Parts	Value of Cars and Parts
1908	6,530	$11,013,110	$ 7,752,590	$18,769,700
1909	7,747	11,446,570	8,167,335	19,613,905
1910	9,915	13,861,275	9,202,005	23,063,280
1911	11,909	14,902,840	11,661,025	26,563,865
1912	13,164	15,977,580	15,926,135	31,903,715
1913	12,993	15,683,555	17,104,965	32,788,520
1914	12,408	14,714,065	13,167,780	27,881,845
1915	19,792	20,209,690	17,611,990	37,821,680

Re-exports have been deducted from above figures.

BRITISH MOTOR CAR EXPORTS

Year	Cars and Chassis	Value	Value of Parts	Value of Cars and Parts
1908	2,441	$ 4,383,100	$1,909,695	$ 6,292,795
1909	2,801	6,188,935	2,629,090	7,818,025
1910	4,119	7,952,110	5,075,525	13,026,635
1911	5,271	10,505,540	5,425,650	15,931,190
1912	6,457	12,304,695	6,107,645	18,412,340
1913	8,829	14,308,260	7,485,815	21,794,075
1914	7,490	13,259,610	6,482,105	19,741,715
1915	3.764	6,582,040	6,118,915	12,695,955

Pierce-Arrow Repair Cars for British

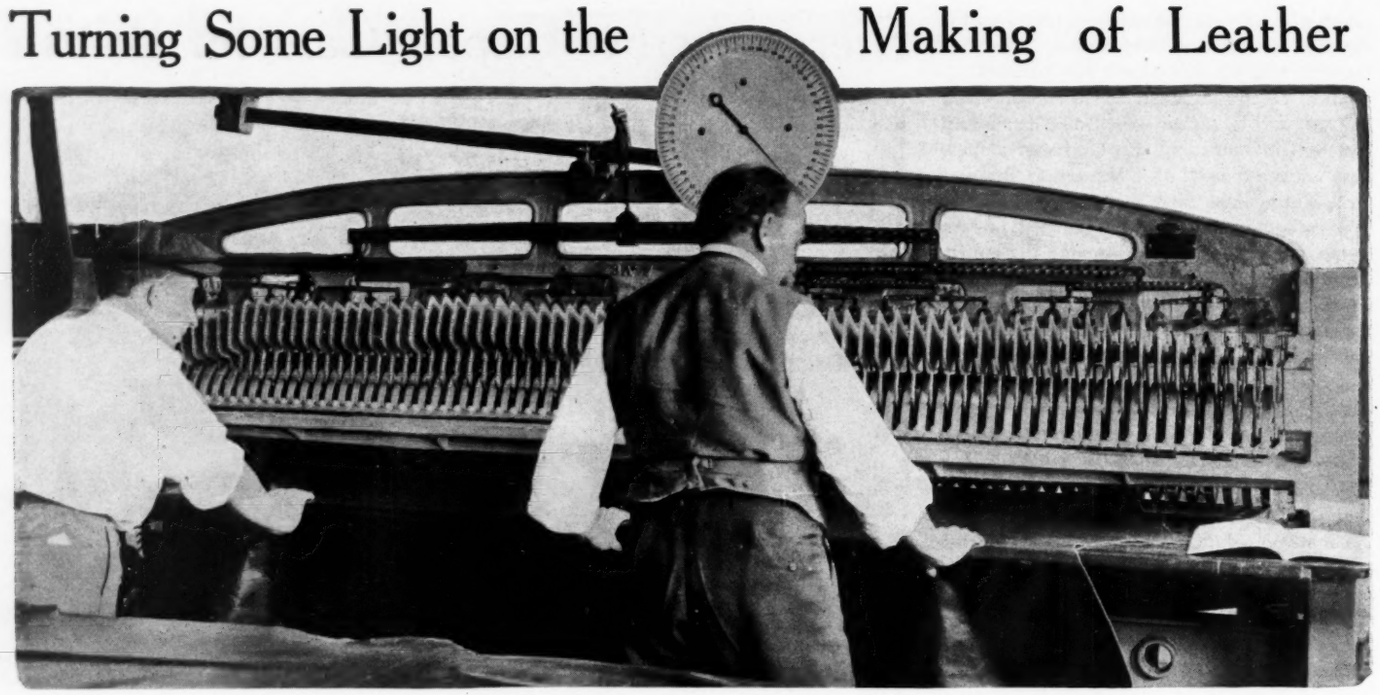


LONDON, Feb. 15—Numbers of the Pierce 4-ton trucks, supplied to the British army, have been fitted as traveling workshops for the convoys to which they are attached. No change is made in the chassis, which is fitted with a platform body with permanent top and a separate cab over the driver's seat. One-half of each side and the rear hinges down so as to extend the floor space and the other half hinges up. Waterproof curtains are fitted to the extension top and can be lowered so as to prevent rain and sun beating in.

Each repair shop is fitted with a Douglas 2-cylinder, opposed motor, directly connected to an electric generator. The machinery consists of an electrically driven screw-cutting lathe, a heavy electric grinder, an electric overhead drill, a small foot-power speed drill, a substantial workbench and also flexible connections for portable drills, electric light sockets, and other equipment.

The usual plan is to supply one of these repairshops to a fleet of forty to forty-five trucks. Several are working in this way with the anti-aircraft brigades scattered along the British front in France and Belgium. These brigades comprise heavily armored cars, equipped with a new type of machine gun, and also ordinary Pierce trucks acting as feeders to the armored cars and doing general work. Except in the rare cases where the cars have received a direct hit, these repair shops are capable of undertaking all work required by the convoys.

Turning Some Light on the Making of Leather



Machine for measuring leather. The hide is run through this device and the rollers indicate on the dial the number of square feet in the hide

By William K. Gibbs

ASK the average layman what he knows about the value of oil paintings and he will answer truthfully—"nothing." Ask him what he knows about leather, how it is made, the different grades and wearing qualities of each, and if he will be as truthful in answering your second question as he was the first, the reply will be practically the same. If he has no connection with the leather industry; if he does not use it in his business, get him to explain the processes of preparing leather to you. Ten to one it does not take him long.

Subject Not Well Understood

When we stop to consider that there are a round hundred million of us in this country, all of whom find leather in larger or smaller quantities indispensable, it seems peculiar that general knowledge of it is so meager among the masses. This 100,000,000 people wear shoes, which we will say average $3 a pair in value, making a stupendous total value in shoes of $300,000,000 daily worn in this country. I may be criticized for putting the average at $3, but I believe I do so advisedly since I recently read of a popular movie and theatrical star who claims ownership to 130 pairs of shoes—I'll gamble that any one pair of them cost over $3—and these will help bring the average up.

However, this story has nothing to do with shoes, but it has something to do with leather. I only drew the analogy to bring to your mind the amount of leather used, just for shoes, to say nothing of that which goes into other manufactured articles, and it seems almost incredible that the knowledge of leather-making should be so little understood. If you, Mr. Reader, own a motor car, was the upholstery a factor in making up your mind to buy? If so was it because it matched your bulldog, or for some other reason equally important?

The wonderful tanning, currying and finishing processes of the present day are the slow growth of centuries, and the production of leathers of the modern quality and variety is the culmination of years of study by practical tanners and chemists. Probably the original process of curing skins was that of simply cleaning and drying. Then the use of smoke, sour milk, various oils, and the brains of the animals themselves was found to improve the texture of the leather. Later it was discovered that certain astringent barks and vegetables effected permanent changes in the texture of skins and stopped decay. This knowledge was possessed by the ancient Egyptians, for engravings on their tombs depict the process of tanning. In China specimens of leather have been found in company with other relics that prove them to be over 3,000 years old. The Romans used leather which they tanned with oil, alum and bark.

With the process of tanning conceived at so early a date it seems all the more remarkable that no books giving accurate knowledge of tanning are available. This is accounted for by the fact that different skins require different treatment and the time they must be cured, or left in one solution or another, is something to be determined only by the tanner, for skins, like human faces, while fundamentally the same, are all, or nearly all, different.

Preparing leather for different uses offers as many ramifications as does the tanning. For that reason no attempt will be made to explain the necessary work for any except upholstery leather—that entering into the construction of motor cars and the better grades of furniture.

The structure of animal skin consists of several layers which behave differently in a chemical as well as in a physical respect. The upper part of the skin in which the coat of hair is rooted is a thin layer termed epidermis, or cuticle, the same as the outer skin of humans. Next below this is the much thicker corium, or

The Grain Side

The portion of the skin exposed by the removal of the hair and epidermis technically is termed the grain side. The corium, or true skin is the actual leather skin and is made up of interlaced bundles of gelatinous fibers. It is more or less filled with fluid matter that serves to renew the cuticle and maintain the skin in a pliant and moist condition. In the tanning process these matters are removed, reducing the weight of the skin considerably, and there remains nothing but the fibrous portion to be acted upon by the tanning materials.

As soon as the hides have been removed from the backs of the animals they must be cured to preserve them for shipment to the tannery. Hides are usually cured in three ways—dry, dry-salted, or green-salted. In hot climates hides are dried when taken from the animal by laying them in the sun. They dry out very firm and hard and can be kept an indefinite time in this condition. For better preservation, the hides are sometimes sprinkled with salt before being dried and then are called dry-salted. Hides prepared in this manner are shipped in bales containing fifty to a hundred. Green, or wet-salted hides are prepared by sprinkling and rubbing into them a large quantity of salt

after they are taken from the animals while they still are moist. In this condition the hides are piled and left to drain and cure for a month.

Preparing leather comes under three heads. First, the beam house work, or preparing the hides for tanning, consists chiefly in removing from one side of the hide the epidermis and hair and from the other the under skin of loose connective tissue and adhering flesh. Next, the tanning, which may be roughly defined as the preparation of the hides so as to prevent putrefaction. This means the animal fats in the skin are removed and the fibers separated from each other and brought under the action of vegetable tannins or mineral substances which unite with or coat the fibers to make them insoluble and proof against decay. Third, the finishing, which will be told of a little later.

When the hides are received at the tannery they are sorted according to the kind of leather for which they best are suited. The wet-salted hides are trimmed to remove all waste parts. The dry hides are trimmed after being soaked. The hides are soaked in water to soften them and to remove the salt, blood and dirt that adhere. After the hides have been thoroughly softened and cleaned they are fleshed, which consists in removing all the fleshy and fatty matter from the flesh side of the hide.

Brine Bath Removes Hair

In order to remove the hair and epidermis the hides are placed for several days in vats containing milk of lime, which loosens the hair and epidermis and swells and splits up the hide fibers. Sulphide of sodium also is used along with the lime to speed up the removal of the hair. Hides for soft leathers are allowed to remain in the lime longer than those for firm leathers. After the hides have had the hair removed, they are washed and passed through the fleshing machine again.

The next process is known as bating, and consists of treating the hides to remove the lime from them. The bates consists of bacterial fermentations of brans and of various manures or patented preparations which induce bacterial action. The hides are put into paddle vats in which the bate is mixed with a large quantity of water. After the lime has been removed by bating, the hides get a fine silky grain.

Next comes a short treatment in vats containing a weak solution of sulphuric acid and salt, called a pickle.

Pouring naphtha into boiling oil. The gases arising must be broken up or they will seek the nearest fire

This cleanses the hides, opens the pores to receive the tan liquor and gets the hides into an acid state. When the hides come out of the pickle they are clean and white.

The next process is the tanning itself. The materials used in making the tan liquor have been mentioned previously. Oak and hemlock bark are the chief vegetable tannins used. After the hides have been in the tan liquor sufficiently long they are removed and split. This is done by presenting the edge of the hide to a sharp revolving band, or belt knife, which passes through it parallel to its surface, splitting the hides very quickly and neatly into two thicknesses, or more. The belt knife splitting machines consist of a steel belt about 2 inches wide running rapidly in tension over two pulleys through a horizontal grooved guide, and kept sharp on one edge by an emery wheel. Against this edge the hide is forced by passing between brass rollers, the upper part of which is straight and perfectly rigid, while the under one is in sections resting on a lower roller of India rubber and thus can give to the inequalities of the leather. The upper split is of even thickness, while the inequalities remain on the lower split.

The first split carries the grain and the other splits are made into the cheaper grades of leather. Some of the splits are retanned and buffed on an emery wheel, then dyed and finished.

Currying leather consists of placing the hide on a flat board and going over it with scouring stones to work down the grain.

Japanning leather, that is, giving it the finish commonly known as patent leather, is a process different from that of making Spanish leather. After the hide has been curried it is given a daub coat, the material used being a solution of linseed oil and naphtha. The linseed oil is boiled until it has a jelly-like consistency and the naphtha for thinning is mixed in while the boiled oil has a temperature ranging between 250 and 300 degrees. This is put on with a tool known as a slicker. A side view of this tool looks very much like the ordinary chopping knife, only the edge is not quite so rounded. One side of the lower part is square and sharp, while the other is somewhat rounded. The daub is put on with a brush, then worked in with the sharp side of the slicker and spread with the dull, or rounded side. So experienced are the men applying this that they work to the very edge of the hide without allowing any of the daub to go over and reach the bottom side of the hide.

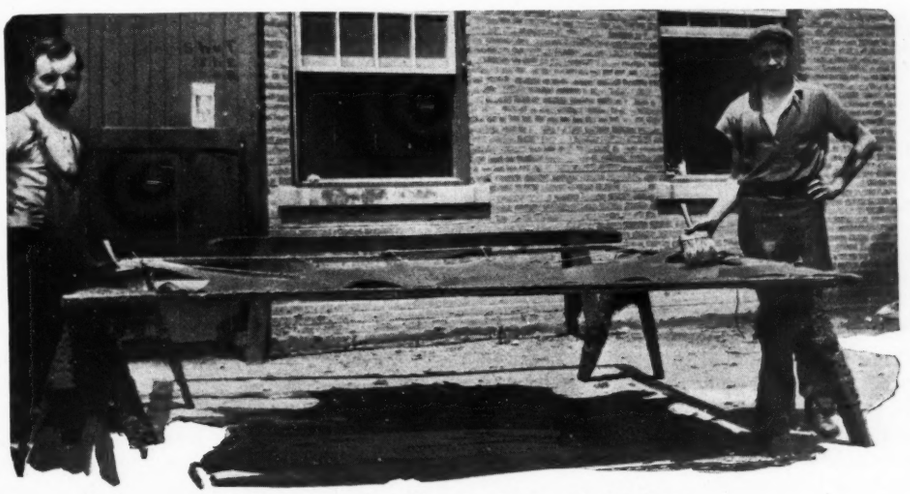
Painting the Hide

Next the slicker varnish is applied in the same way and then the hide is given the paint coat. This paint coat is of paint very similar to house paint, only much thinner. The method of application differs from ordinary painting in that it not only is put on, but is brushed into the hide.

The Spanish leather is made the same as the Japanned except that after the grain has been applied, there is a process known as wiping out, which is done with cloths dipped in naphtha.

The grain is put on with a device like a printing press. The design of the grain is etched on copper plates something like an ordinary halftone, or electrotype. Then the hide is placed in the press and the grain embossed at 140 degrees Fahrenheit, under 120 tons pressure. The grain

(Continued on page 40)



Illustrating how the color is given to the hide

The Motor Car Repair Shop

Caring for the Battery—Part 1

ALTHOUGH Motor Age has frequently explained the many points about a storage battery and has carefully gone into the methods of taking care of them and curing them of their ills, inquiries continue to come in regularly regarding this very important accessory of the car of today. Probably the cautionary remarks, the directions and the hints on how to keep out of battery trouble bear repeating at intervals, and particularly at this time of the year when cold weather is a handicap.

On cold days when the motor gets cold and it requires considerable cranking to start it, the battery is more apt to get exhausted than at times when no such extended cranking is necessary. Then too, there is less chance for the generator to replenish the spent charge, as in the winter the runs are shorter. Hence it is very important to have the specific gravity tested very frequently. The big storage battery makers maintain service stations in all large centers and the fortunate motorists who live in them should take advantage of the service at least to the extent of having readings taken often. In rural districts the motorist must have his own hydrometer so as to do his own testing.

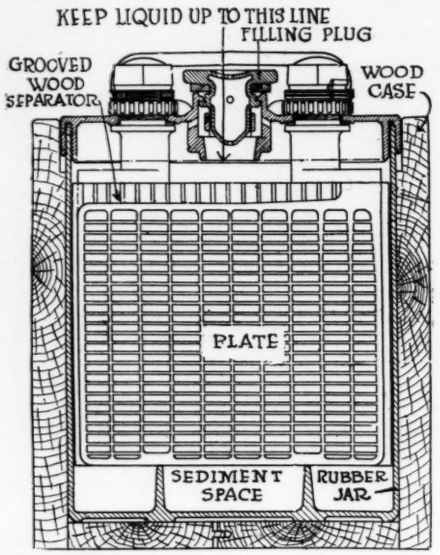
Fully Charged; Won't Freeze

There is absolutely no danger of a fully charged battery freezing, but even in moderate climates there is much danger when even three-quarters discharged. The following table is given by the Willard company and will serve to show just what you can expect at different temperatures:

SPECIFIC GRAVITY OF ELECTROLYTE	TEMPERATURE AT WHICH BATTERY WILL FREEZE
1.120	20 degrees above zero
1.160 (three-quarters discharged)	Zero
1.210 (one-half discharged)	20 degrees below zero
1.260 (one-quarter discharged)	60 degrees below zero

From this it will be seen that the fully charged battery can withstand temperatures lower than would ever be encountered, but this imperviousness to cold decreases rapidly as the degree of charge diminishes. Inspection of battery condition should at the outside not be at longer intervals than 2 weeks during the winter months. With a little common sense attention, nine out of every ten cases of winter battery annoyance could be avoided. From the above it is also evident that when a battery is stored for the winter, the precaution must be taken not to put it where the temperature is below normal.

Using a hydrometer syringe is the only safe way of determining the condition of a battery, and its readings are an absolute indication. There should not be a variation of over 25 points between the



Illustrating how plates are arranged in the Exide battery

readings of all cells. For example, if one cell reads 1.275, the rest should be not lower than 1.250. If there is any lower reading than this, you are sure that the cell having that gravity is not in good condition, due to a leaky jar, lack of water or other causes.

One of the most important things to do is to keep the electrolyte at the proper level in all the cells. The liquid must always cover the plates to a depth of about ½ inch, and never add acid but pure water. Water that comes from iron pipes or metal containers is apt to have particles of iron or other metal in it, and this causes trouble when it gets into the battery solution. Acid should never be put into the solution in the cells unless some has been spilled or a jar is cracked so as to allow a leak. The point is that the water evaporates, whereas the acid does not, hence if more acid were added when the solution gets low due simply to evaporation, it at once becomes apparent that the proportion of acid to water is increased instead of being in the constant proportion of about two parts acid to five of water, by volume.

If it is certain that the solution is low due to spillage or breakage of the jar, then, of course, more of the acid-water mixture must be put in. The electrolyte is prepared by mixing the pure water with chemically pure sulphuric acid in the proportions of 5 to 2, respectively. To mix them, first measure out 2½ quarts of water, say, and put it in an earthenware or other receptacle that will not be hurt by the strong acid that next should be added slowly as the solution is stirred. Keep pouring it in a little at a time until 1 quart has been put in. Never pour the water into the acid, but put the acid into the water, as excessive evaporation of the water would take place if the operation were reversed. Due to this evaporation that cannot be prevented the resulting solution will, strangely, not amount to 3½ quarts as would naturally be expected, but it will come to about 3¼ quarts. This should be enough to replenish any ordinary spillage, but if more is needed it can be mixed in the same relative amounts. After the mixed solution cools the gravity should be about 1.300, as the gravity of the acid is 1.840 and that of the water is 1, of course.

Sometimes the tar composition material that is on top of the cells cracks, and very often these become serious points of leakage of the cell solution. The best and simplest way to remedy them is to seal them together with a hot iron such as an old cold chisel or similar tool. Press the hot iron on to the sides of the crack and gradually work them together until the hole is sealed over. If more of the tar material is needed, a big lump of it can be secured from a battery service station for almost nothing.

Corosion of Terminals

Corrosion of the terminals or other parts of the connectors should be prevented by coating them with vaseline or petroleum jelly. Sometimes they get so badly corroded that it is almost impossible to unscrew the terminals, and greasing them in this way will prevent recurrences of such trouble. When overhauling a battery it is a good plan to put all the connectors, terminals and other removable pieces at the top in a strong solution of soda and hot water and let them stay in it for about an hour so that the solution will have plenty of time thoroughly to clean them. Then put on the vaseline and no more corrosion should appear. In the first place it is usually the result of overfilling the jars or spilling the solution which in time acts upon the lead and brass terminals.

Never attempt to repair a cracked or broken battery jar, as this is impossible. When the jars get in this condition they must be discarded as useless. It is not very much trouble to remove any cell from a battery because the makers have seen to this point. To take apart the connectors on a Willard battery, for instance, the procedure is to drill a ¾-inch hole in the

end of the connector, directly over the post. This hole should be drilled with any form of drill and about two-thirds through the connector, when the latter will come off readily. The connectors have to be burned back on and more lead used to fill up the drilled out hole. To remove a cell from an Exide battery, the top nuts and connectors must first be taken off, the nuts unscrewing in the regular manner.

Referring to the sectional view of one of these standard makes of batteries, it will be seen that the plates and separators rest upon ribs projecting from the bottom of the jars. Thus an open space is left at the bottom for the accumulation of sediment without its coming in contact with the plates. If the sediment space fills up, however, until the sediment touches the plates they will be short circuited more or less and the battery quickly runs down. So, in overhauling a battery, it is one of the principle considerations that the bottom of the jars be thoroughly cleaned of all material.

Never attempt to make new wood separators to replace worn out ones. Ordinary wood will not do, and the specially-prepared pieces should be obtained from a battery concern. These wood pieces are specially treated to make them immune to the acid's attacks, and they are specially grooved and made of certain kinds of wood which have no harmful chemical properties.

Manufacturers' Communications

INDIANAPOLIS, Ind.—Editor Motor Age—Considerable interest has been aroused among motorists by the publication of an article in a certain accessory house organ of large circulation, to the effect that the action of straining gasoline through a chamois generated a charge of static electricity sufficient at times to ignite the gasoline and cause disastrous results; and this article has been reprinted and given wide circulation by one of the motor car insurance companies.

In the interest of Marmon owners, the service department of the Nordyke & Marmon Co. has had this situation thoroughly investigated, and eminent authorities seem to agree that there is nothing whatsoever in the report that passing gasoline through a chamois generates an electrical charge.

In this connection, the report from Arthur L. Foley, head professor of physics at Indiana University, is of interest. Professor Foley writes as follows in answer to the Nordyke & Marmon Co.'s inquiry:

"Pouring gasoline through a funnel with chamois strainer does not of itself produce a charge, and it makes no difference whether the funnel is supported by a person or by the gas tank. The article is in error in saying that the funnel is grounded when in the tank, and insulated when in the hand. If there is insulation in either case it is more likely when the funnel is in the tank, as the car stands on rubber while the man usually does not.

"As a matter of fact there would be very rare cases, indeed, when both were not grounded for potentials sufficient to produce a spark. But on a day when the atmosphere is very dry as it is usually on a cold, clear day, a man may become charged by scuffling about on a clean dry floor, or his clothing may become electrified by friction, as noticed sometimes when combing the hair.

"Under such circumstances pouring gasoline through a funnel, whether or not there is any chamois in it, gives rise to induce charges that are quite too complicated to undertake to explain in a few words. Such charges might fire the gas. Indeed the original friction charge might do so under certain circumstances."—Nordyke & Marmon Co.

COLORING RUBBER FOR TIRES

Akron, O.—Editor Motor Age—For many years there has been a discussion as to the relative merits of different colors in rubber goods. Some people wonder whether a gray rubber, a black rubber, a white rubber, or a red rubber is best. Pure rubber, as it is tapped from the tree, is a creamy white liquid. It is sometimes coagulated to retain this creamy white color, but more often it is smoked, which gives it a transparent, brownish color.

All rubber, when used commercially, has to be vulcanized with sulphur. If the rubber is pure and contains nothing but sulphur, it will be a gray color after it is vulcanized, but when stretched out into thin sheets and held up to the light, it will be almost transparent and of a pale brown or creamy color. Any other color than this is given to rubber by the addition of various chemical substances for imparting to it special properties, usually to toughen it and to give it additional wearing qualities, or chemical adulterants may be used which have no virtue whatsoever, but are used solely to cheapen it. A pure white color is usually produced by the addition of oxide of zinc, which has long been known as one of the best toughners of rubber, and has been extensively used in the manufacture of tire treads. Black is usually produced by the addition of lampblack, or some organic chemicals. Reds are produced by the addition of antimony or oxides of iron.

Some time ago most tires were gray, usually on account of the combination of lead and zinc oxide. The discovery of new materials to replace lead, made possible the production of tougher white stocks. The present war has had the effect of decreasing the supply and increasing the price of one of these materials; namely, oxide of zinc. The imported oxide has increased in cost over 400 per cent and there is practically none obtainable even at its present high cost. The American-made oxides, which also have increased somewhat in price, are not sufficient to take care of the requirements of the trade, necessarily limiting the supply of white rubber considerably.

The mere color of rubber, however, indicates absolutely nothing as to its quality; both tough stocks and poor-wearing stocks can be made in any color—white, black, red or gray. A tire is an article of utility which should be compounded with the idea of service and mileage, and not color. It would be hopelessly impossible to determine the quality of rubber by its color, and should people insist on particular colors or combinations of colors in tires, they ultimately would have to pay a pretty high tire mileage bill for this small satisfaction.—P. W. Litchfield, Factory Manager, Goodyear Tire & Rubber Co.

DOUBLE CANTILEVER SPRINGS

Grand Rapids, Mich.—Editor Motor Age—I have carefully read your article on pages 26, 27 and 28 of your February 10th issue, and I wish to state that I feel I have many reasons for a most decided objection to your classifying the Marmon cross spring as being of the double cantilever type. As a matter of fact, I fail to see any form whatever of a double cantilever spring or a single cantilever spring in this construction, the construction being merely an inverted full elliptic and should give substantially the same action in every way, as a full elliptic; that is, without reference to the intervening block. The action or purpose of this intervening block also, of course, can be taken care of equally as well in any full elliptic.

We have for the last year been using the only form of double cantilever spring construction that we ever have known of being used in the United States. I now have application pending in the patent office covering this double cantilever spring construction, and I feel warranted in taking a very decided objection to your classifying the Marmon spring as being a double cantilever in any form or nature.

I very much regret that you did not see fit to publish our construction in your article and I will greatly appreciate your publishing it in your next issue together with a statement that I have objected most emphatically to the right of the Marmon company to classify its spring construction as being of the double cantilever type in any way whatsoever.

It has neither the appearance or performance of a cantilever spring in any way and any attempt to classify it as such must be an attempt to sail under false colors.—Walter S. Austin, Austin Automobile Co.

The Readers' Clearing House

"Unconsidered Trifles," Says Reader, "Bane of Present Design"

Several Instances Are Explained Which Materially Detract from Pleasure of Operation

JEFFERSON, Ia.—Editor Motor Age—In these happy days when all cars are good and the best are only better than the others; when stock cars will go 70 miles an hour and keep going 22,000 miles without a stop; we, the owner-drivers, have really very little to kick about. But since all the major points are in good order, by all means let us growl a little about the unconsidered trifles of present day design. Progress we must have, in some direction, even though it involves only an improved design of door handle, and nothing which makes for the general satisfaction and comfort of the thousands who drive or are driven, is trivial.

Yesterday I had occasion to give my own excellent car a general lubrication and looking over. As usual, my admiration of the salient points of design and of the fine workmanship, was reinforced and stimulated, and as always, I was subjected to a number of petty annoyances and some needless work through the unconsidered trifles of construction. In this particular car the front floor board has a hole through which pass the emergency brake and the gear shift lever. To remove the floor board it is necessary to set the brake full on, put the gear shift lever hard to the right of the neutral slot, and then go through a number of contortions ending, if you are both skillful and lucky, in the removal of the board.

If you have only average luck, you remove also the stem of the clock on the instrument board and probably scratch the board or some of the instruments. The makers have so far seen the light in this particular instance that they replace these needlessly long clock stems, when they are broken, with shorter stems. A clock stem does not cost much; but even a trifle multiplied by 20,000 makes a respectable sum, and one which it would seem were worth saving at the price of a little forethought.

A Hidden Bearing

The bearing which takes the thrust of the clutch collar is hidden far down in the bowels of the car, and the instruction book states that it should be lubricated every 300 miles of travel. Here is the process: the floor board is removed as above, after which adventure the toe boards are removed, with a few more contortions, then a plate held by two screws is taken off the clutch housing, a screw extracted from the bearing itself and a filled grease cup taken from the rear spring—unless you happen to have an extra one—is screwed into the opening and turned down. You are now through, except to reverse these operations and reassemble the car, unless you happen to be so clumsy as to drop either the screw or the grease cup into the clutch housing, in which case you will be diverted by a little fishing excursion. Imagine going through with this proceeding after the day's drive, every day, when on tour. And yet there are cars in which this bearing is cared for by a grease cup which projects through the floor boards and is, so to speak, right between the driver's feet. No wonder the little Irish Fergus car, on which nothing but the engine needs to be oiled oftener than twice a year, attracted so much attention at the New York show.

This is perhaps an aggravated instance of the needless difficulties to which poorly thought out details expose the driver of even the best of cars. Yet probably there is no car which does not embody at least a few of these minor mistakes. Who has ever cleaned out the tonneau of a car in which the floor boards are a little lower than the thresholds, without wishing that those nasty little angles in which the dirt lodges and stays lodged despite the best efforts of the whisk broom, had been left out, either by making floor and threshold flush, or by inserting a wedge shaped strip in the angle?

Inconvenient Odometer Setting

How many times have you, friend reader, been tempted into profanity while trying to get your odometer reset at a railroad crossing or other landmark, to tally with the blue book. This year's reset devices are a marked improvement, many of them, but the writer has one of the most popular of speedometers in which this is taken care of by a flexible handle hidden somewhere up under the cowl. You get a firm grip on it and change your reading 2 miles—you want perhaps to reset from 40 to 0, when the handle slips from your fingers and you spend another minute getting a death-like grip on it—then another 2 miles on the dial and it has slipped again. At about that time, unless you have unusual patience you decide to run on the present reading and correct in it your head as you go, and unless you are a lightning calculator you finally do not know whether you are 3 miles from Green River or .5 past the Old Seth Jones place.

Every driver can multiply this sort of thing within his own experience, and the total of time lost and profanity elicited, must be truly shocking. Now, we are a law-loving people; we have laws to cover everything from the place where one expectorates to the form in which he shall smoke his tobacco. Ordinarily if we do not care for anything, if indeed a few of us are ill-pleased with any fact or condition, we promptly pass a law about it. And I should like to make a suggestion to some of the gentlemen who are underpaid for making almost daily additions to our already rather numerous motor car laws.

Legislation for Equipment

Let us have legislation compelling the designer of a car to drive that car, in its completed form, over roads good and bad, through mud and through sand, up mountains and down gullies, in rain and in snow and in tropical heat, with the top up and with it down, on good gas and on bad—in short, under all the circumstances that it will later, when on quantity production, be driven by its purchasers. And let the designer care for that car himself, have him oil and grease it as often and as thoroughly as the instruction book specifies, let him, unassisted, raise and lower the one man top, have him drive it in a blizzard—any motion picture producer can supply one if it isn't that time of year—and see how lovely is the sensation when a stream of sleet comes right through your storm-proof curtains and hits you in the eye.

Oh, this is going to be a mean law, and perhaps it will decimate the ranks of the

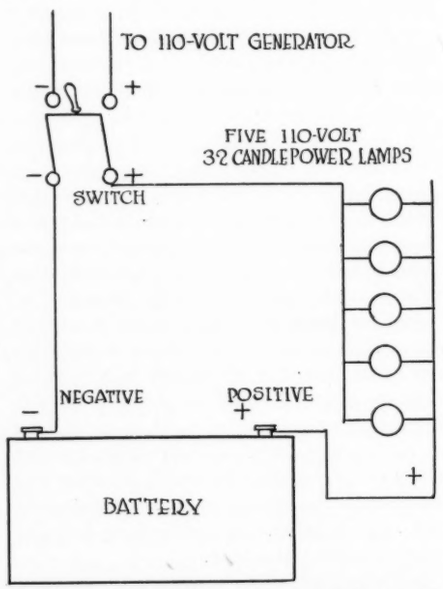


Fig. 1—Charging 24-volt, four-cell battery with 110-volt dynamo

designers as they say of the Russian army, for the first two or three seasons it is inforced. But after that the president who was responsible for putting all the necessary grease cups in accessible positions and eliminating all the needless ones, who made the publicity man's dream on uninterrupted joy in driving come true, who, in short enabled the owner-driver to appear at his meals and at his friends' houses with his hands and his clothes clean and free from graphited grease, that president could be reëlected, which is of course the principle aim of all presidents, even though all Wall Street had just been murdered in Mexico. But possibly the designers, seeing this threat, will get to work in fear and trembling and make next year's cars as much of a joy to care for as this year's are to drive.—C. D. Enfield.

HAS SOME ELECTRICAL TROUBLES

Must Not Run Generator When Battery Is Disconnected—Will Burn Out

Augusta, Kan.—Editor Motor Age—What is the matter with a generator on a Saxon six 1915 model which does not charge?

2—How many brushes has the generator and how are they removed? Will it be necessary to disconnect generator if battery is taken out of car?

3—Please name cars that can or cannot run without hurting the generator when batteries are disconnected?

4—How is the Gray & Davis cutout regulated for lower speed charging?

5—How should cells be connected to Atwater Kent when battery is dead?—Glen S. Bell.

1—There are so many things that might happen to prevent the generator from charging that it would be almost impossible to give you any idea of just what is wrong in your case without knowing the symptoms. Tell Motor Age a little more definitely what seems to be the matter, when we can be of more assistance to you. It might be that something has gone wrong in the internal windings of the generator, or that simply the brushes are worn down, dirt on the commutator preventing proper contact, etc.

2—This generator has four brushes. To remove them it will be necessary to take the generator from the car. Then take off the front cover, when the brushes can be removed very readily. Yes, the generator must be disconnected from its drive if the battery is removed, providing you intend to run the engine.

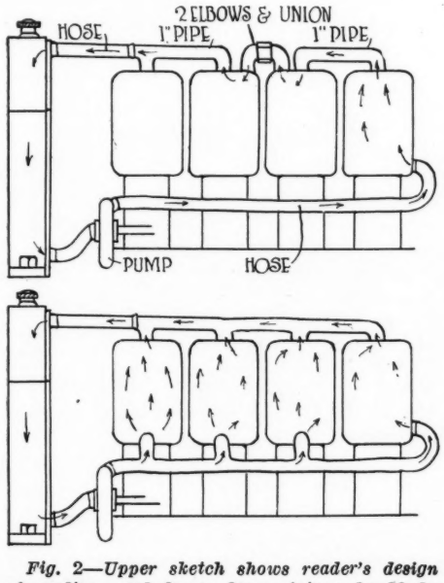


Fig. 2—Upper sketch shows reader's design of cooling, and lower how piping should be arranged to take care of all cylinders alike

3—We know of none which can run with battery disconnected without damage to the generator.

4—It is a delicate job to do this, and you are advised to send the unit to the factory if it does not charge properly. The procedure is simple if you know how, but needs some expert handling to be sure it is properly regulated. There are two screws opposite the cutout points, one for each field connection. Turning these to the right lowers the charging speed, and to the left increases the speed at which the generator has to run to charge. Only a very small turn of the screws is necessary, and to make sure it is adjusted properly, an ammeter should be connected across each to make sure that it is set correctly.

5—We would not advise using batteries of the dry type instead of the storage battery. If it is dead it should be recharged or replaced by one that is charged. For emergency service, connect four dry cells in series—that is, carbon to zinc, carbon to zinc, etc.—and connect the outside terminals on the end cells to the Atwater Kent.

MIGHT PUT IN LONGER PISTONS

Pistons With Greater Length Above Wristpin Give Higher Compression

Colfax, N. D.—Editor Motor Age—I have a 1910 Jackson model 35 and the pistons are getting worn. I am going to put in new pistons and I would like to know if it would be advisable to have the new ones made $\frac{1}{16}$ or $\frac{1}{8}$ inch higher above the piston pins, that is, to have the same effect as putting a plate on top of the old ones, as I have noticed many ask about in the Readers' Clearing House of Motor Age.

2—Could this 1910 Jackson be converted into a speedster successfully, and about how much would it cost? I can do all the work myself.

3—What is the weight of the following cars: Buick D-55, Hudson Super-six, Velie Biltwel 15?—Ed Moen.

1—There would probably be no harm in doing this, and very likely it would add somewhat to the power. Do not get the compression too high, however, as the engine was not designed for it.

2—There is no reason why you could not convert this into a speedster type of car. It would probably cost you $100 or $200 to do a good job, but that is more or less of a guess, for it would be impossible to make any definite estimate without knowing exactly what you were going to do, what changes you intend making, etc.

3—The Buick D-55 weighs 3,600 pounds with tanks empty, the Hudson Super-Six weighs 3,165 pounds with tanks full, and the Velie Biltwel model weighs 3,400 pounds with tanks full.

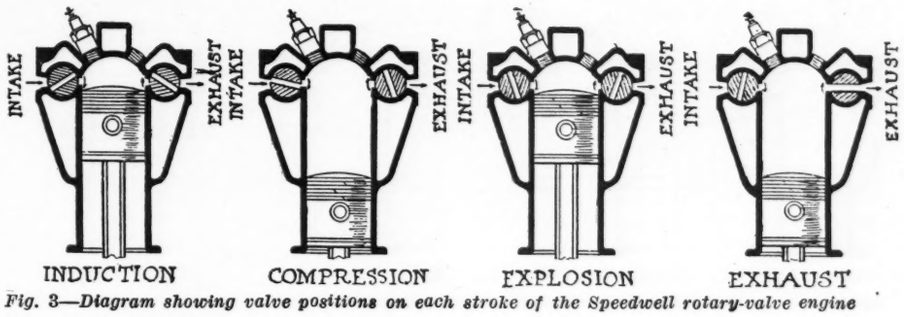


Fig. 3—Diagram showing valve positions on each stroke of the Speedwell rotary-valve engine

HAS TROUBLE WITH DIFFERENTIAL

Probably Binds Within the Axle Housing —Ball Races Cut

Vine Grove, Ky.—Editor Motor Age—I am having differential trouble in my 1914 Maxwell, model 25. Have broken two driveshaft pinions, two drive or ring gears and three differential cross pinions, also the differential thrust bearing balls and ball races are giving trouble. The differential makes a grinding noise when running. Would tightening the wheels on the axle quite tight cause any part of this trouble? Does Motor Age know of any reason for this trouble? Advise how to assemble and adjust these parts to eliminate the trouble.—D. W. Vertrees.

It is imperative, when installing a new differential, that you see that it runs free in the axle housing and that there is no binding whatever. If the differential is too tight it will have a tendency to cut out the races. To overcome this, we believe that it might be well to cut out a portion of the housing behind the ball race so that the differential will turn freely.

The growling noise is caused by the pinion and ring gear meshing too tight. It is practical at all times to make sure that there is a certain amount of back lash in the pinion gear and further, one must make sure that the pinion gear is meshing level with the ring gear.

It is impossible to tighten the wheels too tight to cause any of the trouble you are experiencing, as the axle shafts are tapered and on this account the wheel is drawn up on the taper.

Speedwell Rotary Valve Engine

Columbus, O.—Editor Motor Age—Would like the following information regarding the Speedwell rotary motor: How long manufactured, why discontinued, was it a success, how lubricated, and the advantages and disadvantages?

2—Publish a diagram of this rotary motor.—Dr. G. M. Hiner.

1—This motor was manufactured for about 1 year. It was discontinued because the Speedwell company went out of business. We believe it was moderately successful. Lubrication of the rotating sleeves was obtained by putting the lubricating oil in the gasoline. The chief advantage was the silence and positive valve action, but the main disadvantage was the inability to properly lubricate the sleeves, which had to be a close fit in order to be gas tight.

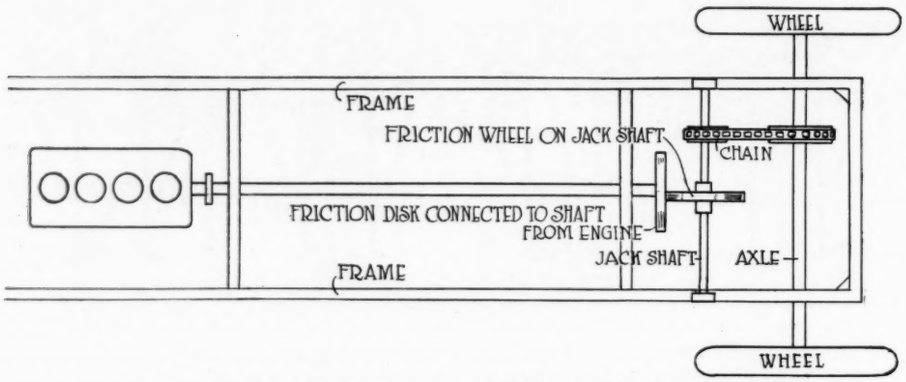


Fig. 4—Diagram of suggested layout for making a friction-drive cyclecar

2—Diagrams of this motor are shown in Fig. 3.

HERE'S AN INQUIRY ON CYCLECARS

Reviving an Almost Dead Topic—Reader Designing a Light Vehicle

Brooklyn, N. Y.—Editor Motor Age—Kindly describe a universal joint and its action.

2—I am building a cyclecar. I have made a 1 by 2-inch chassis. Do you think this will be strong enough to hold a Pierce four-cylinder motorcycle engine?

3—How can this be rigged up to the rear axle, by chain or belt?

4—Kindly give diagram for drive.—A Reader.

1—A universal joint is a mechanism that is designed to have free angular movement with positive rotary movement. Its function is to allow two shafts at varying angles to each other to have a positive driving connection.

2—It ought to be.

3—Better use chain.

4—Diagram of a suggested layout is given in Fig. 4.

To Charge 24-Volt Battery

Sperry, Okla.—Editor Motor Age—My 1912 Cadillac is equipped with a Delco lighting system. The battery is run down. Kindly explain how to charge the 24-volt, four-cell battery. I have a 110-volt dynamo.—W. O. Jordan.

If this is a direct current generator, you could charge the battery with a 6 ampere rate. But if this caused the battery to gas too much, cut the rate down to 4 amperes. Leave it on charge for 24 hours, and connect as shown in Fig. 1. Be sure to put the five 32-candlepower lamps in series with the positive side of the line from the generator.

Why Cooling Is Not Effective

Danville, Ill.—Editor Motor Age—Please give me a diagram for water circulation cooling system of a four-cylinder motor, singly-cast. This is a home-made motor and am unable to keep it cool. This is a rough sketch of how I have it now.—A Reader.

Your trouble is that you do not introduce the water into the bottom of the water jackets of each cylinder. You send it all to the last cylinder, but in the average engine there is an inlet water connection to each cylinder jacket. Fig. 2 shows proper and improper water connections.

Using Unusual Charging Voltage

Westport, Ind.—Editor Motor Age—I wish to charge a 6-80 battery using bulbs for resistance. I have a direct generator, 32 volts, 27 amperes, at 2,800 r. p. m. How many lamps will be required to get a finish rate of 5 amperes; also 12 amperes?—T. A. Pearce.

You could use this generator, but resistance would have to be put in. Special lamps taking 32 volts would be needed unless you had a rheostat. The charging rate for this battery is 5 amperes if you leave it on for 24 hours, or over night. So, with about twenty 32-volt lamps of 32 candlepower, if such could be procured, or forty 32-volt lamps of 16 candlepower, you could do the work. Connect them as shown in the diagram, Fig. 7. being careful to put the lamps in series with the positive side of the charging line. This will give satisfactory results.

CHARGING BATTERIES AND MAGNET

Methods of Connecting 110-Volt Current Sources and Number of Lamps

Centralia, Wash.—Editor Motor Age—Give directions and publish a diagram for charging magneto magnets and batteries from a direct current dynamo 10 kilowatts, 110 volts, 82 amperes. I desire something inexpensive and simple.—E. B. Anderson.

For diagram of connections and directions for charging magneto magnets from a 110-volt source see page 46 of the February 3 issue of Motor Age. In charging storage batteries, the connections are as shown in Fig. 8. Be sure to put the lamps in series with the battery and connect them to the positive side of the charging circuit as shown. The lamps are in series with each other. The average 6-80 storage battery as used in motor cars has a finish charging rate of 4 amperes, hence you would need either four 32-candlepower carbon lamps or eight 16-candlepower ones connected as shown. In any case the finish charging rate is given on the battery nameplate, and you should use as many 32's as the number of amperes finish rate, or twice as many 16's. Leave the battery connected to the source in this way for 24 hours, or until each cell gasses freely, or until the specific gravity of each cell is about 1.300. Two 12-hour periods will do just as well.

Wiring Diagram of 1912 Cadillac

Lowville, N. Y.—Editor Motor Age—Please publish wiring diagram of the Delco system as used on the 1912 Cadillac.—Subscriber.

1—The wiring of the Delco starting and lighting system used in the 1912 Cadillac is shown in Fig. 5.

Charging From 220 Volts

Benson, Minn.—Editor Motor Age—Publish a sketch showing the wiring from a 220-volt D. C. for charging from one to six storage batteries.

2—Could the current be connected direct with the batteries if one had a sufficient number of batteries? How many batteries or cells would this require?—A. F. Nelson.

1—This is shown in Fig. 6.

2—No.

SOME MORE ABOUT OPERATION

Answers Criticism and Advances Other Thoughts on Car Handling

Chicago.—Editor Motor Age—In Motor Age issue of February 3, I read a communication from C. R. K., verifying several of my statements of my communication which appeared in January 6 issue on incompetent motor car owners and a majority of garage men and so-called mechanics in ignition and carbureter adjustments and other work about a car. I thank him very much for making his statements as he most likely knows the mechanical end of it as well as myself. There are quite a few motor car owners that don't know the principle about a motor car and this includes the accessories. As far as the storage batteries are concerned, I will say that to a man who is experienced and knows the different principles of its operation and care there is very little room left for such a thing as a bugaboo.

This gentleman kind of misunderstood my argument in regard to being a good driver. I meant that for a motor car owner to enjoy his investment in a machine of this kind, he ought to know his machine from A to Z and there is no reason why he should not. He has the same amount of brains as any other man, and why isn't it possible—and it should be so—for a car owner to know his car the same as a garage mechanic. A mechanic has to know the mechanism of different cars and the different principles of operation, or he cannot get a job as such in a station or garage.

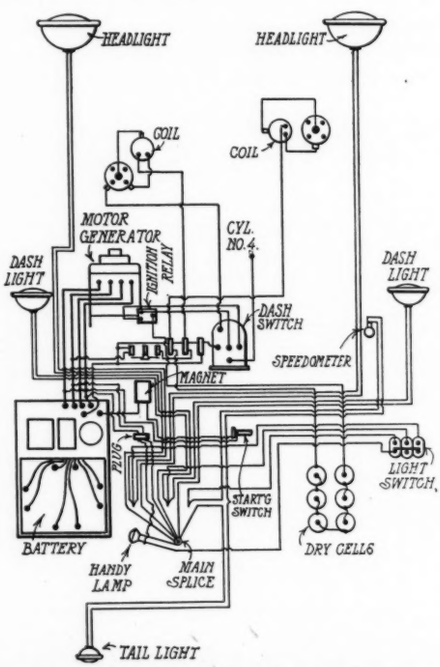


Fig. 5—Diagram of the wiring of Delco starting and lighting system on 1912 Cadillac

Anyone can be a driver with a little teaching, but let them take their cars out on some country road with many hills and then ask him to go through the grind that an expert motor car tester has to with several different adjustments for corresponding speeds and if he does not understand his car and its mechanism thoroughly, I do not think he would succeed in bringing the car to an A1 condition of adjustment. There is a whole lot more mechanism to a motor car than a steering gear, a clutch, a brake or a beautiful body. A beautiful body makes the car attractive but it hardly will be able to run the car. The sales or investments nowadays are being centered on body type without much consideration as to the mechanical end. This is a positive fact.—John Connell.

FIRING ORDER OF TWO TWELVES

Inter-Relation Between Cylinders on Each Side of Block Shown

Bartlesville, Okla.—Editor Motor Age—Please explain whether the **Packard or National** twin sixes fire one line of cylinders and then the other, or do they go from oneside to the other? Also state the firing order of a Ford. I have one that fires 1-2-4-3 and have been told that it was out of firing order.—M. P. Shook.

1—Both the Packard Twin Six and the National Twelve alternate from one side of the V to the other in firing. You can figure the inter-relation between the cylinders for yourself with both these motors by following these directions:

Draw twelve circles in two rows of six each to represent the twelve cylinders. Number the one corresponding to the right front cylinder, 1 and continue to number each succeeding cylinder on the right side consecutively to 6. Then number the left front cylinder 7 and then consecutively down, making the left rear cylinder 12. With this diagram before you work out the firing orders of the two motors, which are as follows:

Packard—1-12-4-9-2-11-6-7-3-10-5-8.

National—1-12-9-4-5-8-11-2-3-10-7-6.

By drawing lines from the first cylinder firing on one side to the one on the other that directly follows it, you will be able to see the inter-relation between the cylinders on each side of the block.

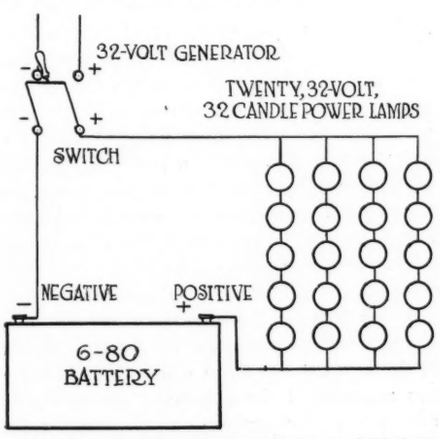


Fig. 7—Showing how to charge a 6-80 battery with dynamo giving 32 volts, 27 amperes at 2,800 r. p. m.

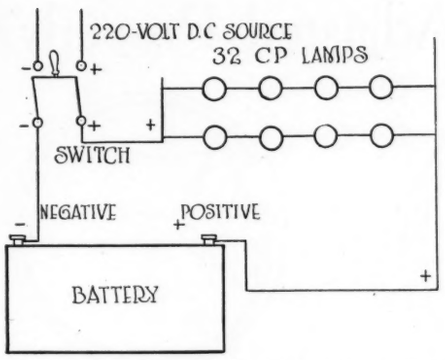


Fig. 6—Illustrating wiring for charging battery on 220-volt D. C. circuit

Inquiries Answered and Communications Received

C. D. Enfield.....Jefferson, Ia.
Glen S. Bell.....Augusta, Kan.
Ed Moen.....Colfax, N. D.
D. W. Vertrees.....Vine Grove, Ky.
Dr. G. M. Hiner.....Columbus, O.
A Reader.....Brooklyn, N. Y
W. O. Jordan.....Sperry, Okla.
A Reader.....Danville, Ill.
T. A. Pearce.....Westport, Ind.
E. B. Anderson.....Centralia, Wash.
Will Elbert.....Pittsburg, Kan.
A. F. Nelson.....Venson, Minn.
John Connell.....Chicago
Mark Cronin.....Marengo, Ia.
M. P. Shook.....Bartlesville, Okla.

No communications not signed with the inquirer's full name and address will be answered in this department.

2—1-2-4-3 is the proper firing order for the Ford, although this is contrary to the order found in the majority of the four-cylinder cars, which is: 1-3-4-2.

THE ACTION OF PETROMORTIS

Mechanical Engineer Expresses His Opinion of This Form of Poisoning

Moberly, Mo.—Editor Motor Age—In the December 30 issue, under the heading of "Petromortis" or exhaust gas poisoning, Motor Age made some statements and quoted an eminent physician, to which statements I take exceptions. I wish to express my views on this subject, which are the outcome of personal experience.

In the first place there is a percentage of 2.81 of gasoline which is absolutely non-combustible in an internal combustion engine; also a 13.7 per cent of coal oil in the same engine. If an engine were a perfect scavenger this would not be the case. On the other hand, the assertion is made that this poisonous substance is not carbon monoxide or dioxide gas, whereas in laboratory tests this has been proven to be carbon monoxide in a very virulent form. Tests have proven that a gas engine, under the best of conditions, will give off 2.12 per cent of carbon monoxide gas, whereas .1 of 1 per cent is fatal in an air-tight room.

I would refer you to the Milwaukee Loco. Mfg. Co., or the Geo. D. Whitcomb Co., New Rochelle, Ill., which concerns would give much to be able to overcome exhaust gas poison as their machines are built for underground work. I have used these machines under compressed air pressure of 15 pounds and have used all known remedies. The Milwaukee company takes care of it by exhausting into a cast-iron heater with branch pipes submerged in a tank holding about ½ barrel of water and chloride of lime, which to a certain extent reduces the poison effect. The effect of this gas is not sudden, as the action is on the nerve system entirely. It comes on gradually, first producing a mild headache which gradually works to the base of the brain nerves and eventually causes stupor, which can be overcome by fresh air.—F. R. McDonald, M. E.

INTERESTED IN MULFORD SPECIALS

Wants Data on Car Built Especially for Charles Whitney

Marengo, Ia.—Editor Motor Age—I notice in the December 2 issue of Motor Age several cuts illustrating a car built by Ralph Mulford for Charles Whitney of Chicago. Could Motor Age kindly furnish me with the following information regarding same?

1—What are the riding qualities of the car at fair speeds over ordinary country roads?

2—How is it for acceleration?

3—What would Ralph Mulford charge for building such a car?

4—It is presumed that this car was made up for road and pleasure use and not for racing.

5—I am very much interested in knowing what the maintenance of such a car would amount to. That is, about how many miles per gallon of oil and also the mileage of tires?—Mark Cronin.

1—Exceptionally fine riding qualities. Car carefully balanced and having double set Hartford shock absorbers. Springs 56-inch by 2¼-inch rear, 36-inch by 1¼-inch front.

2—Very quick,same as racing car.

3—With runabout body $4,500 f. o. b. New York.

4—Made for road use, but easily can be transformed into racing car.

5—Gasoline consumption about 10 miles per gallon. Oil consumption somewhat more than ordinary stock car owing to fact that high speed engine is used. The weight and balance of car allow for long tire mileage but as this type of car is usually driven by speed fans the tire mileage depends mostly on the driver.

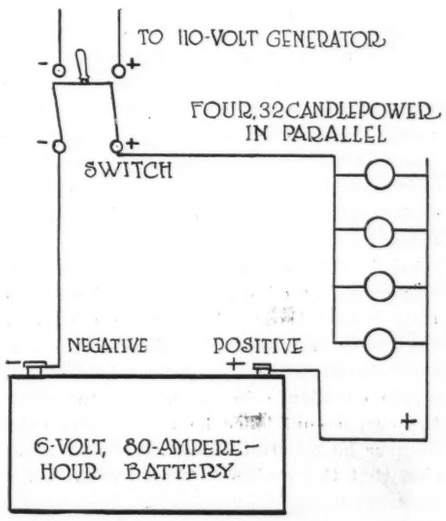


Fig. 8—How to charge battery from a direct current, dynamo, 10 k-w., 110-v., 82-amp.

Are Your Brakes Adjusted Properly?—How It Is Done

Methods of Setting the Various Kind of Foot and Hand Brakes

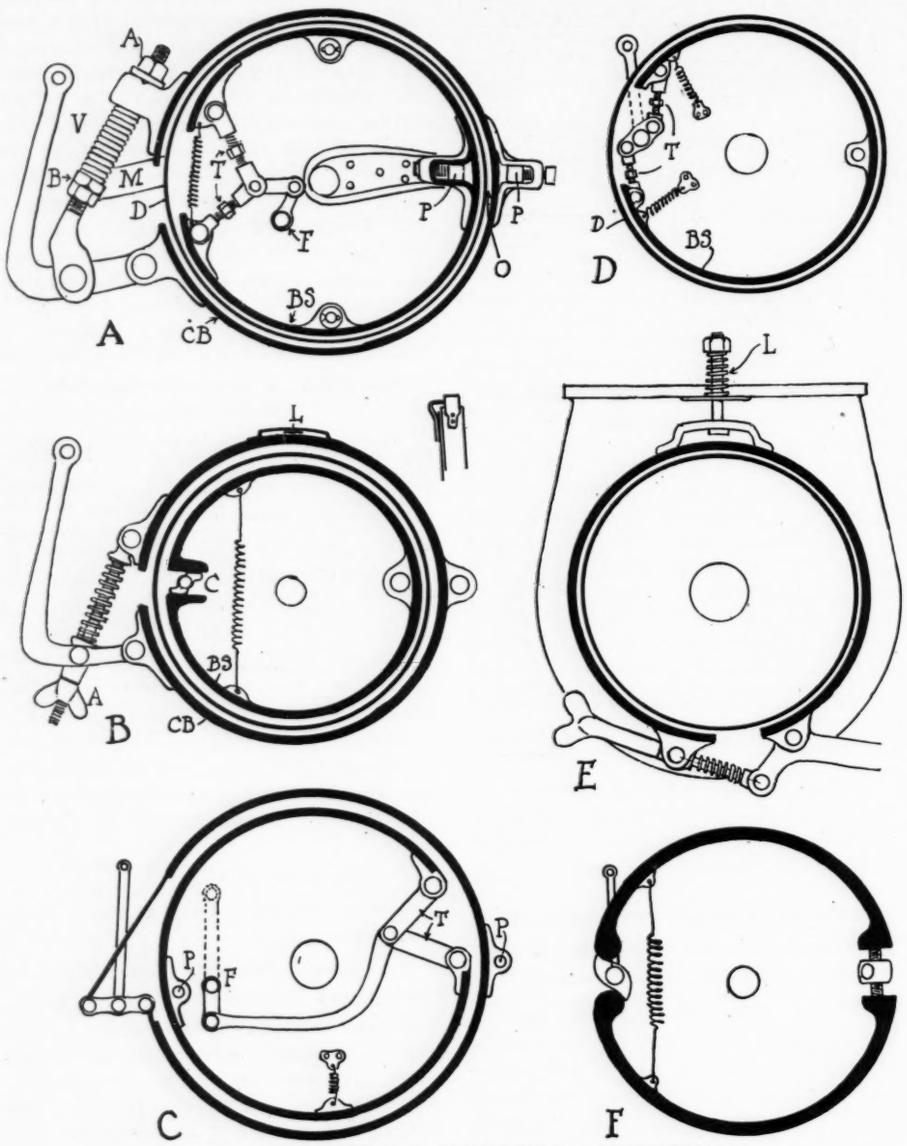


FIG. 1—ADJUSTING VARIOUS TYPES OF BRAKES

A, may be adjusted at points of control and for clearance at O. B, simple adjustment for external shoe. C, non-adjustable type. D, double internal type, short toggle adjustment. E, transmission brake. F, double internal type adjusted by worm and screw at opposite side from point of control

By Marcus Dods

ONE of the most vitally important details of a car's construction is the brake system, and also, strange as it may seem, there is no other place about the car that receives so little attention. Why is it that the majority of motor car owners fail to give the brakes of their cars the attention that is so justly deserving and needed? When one takes upon himself the responsibility of driving a car he places himself and those who may be with him in a very unpleasant, and sometimes, a death-inviting position, unless he has absolute confidence in his ability to brake the car, a confidence he can possess only because he KNOWS, from frequent inspection that the brakes will hold even under the most trying circumstances. It is wrong to suppose that because the brakes worked all right the last time they were used that the same degree of service will go on forever.

There must be some reason for the general neglect of the brakes. Is it because motorists fail to realize the necessity of possessing good brakes? Or is it because of lack of knowledge of how to go about it?

It is not expected that everyone should know the amount of strain in actual pounds that the brake mechanism has to bear when one applies the brakes for stopping of the car. That the amount is enormous is all the more reason why the brakes should be adjusted properly more than once or twice every year.

Brakes that receive little attention may fail to perform their work at what may be a most critical time. No doubt a great many motorists can recall just such a time; perhaps the result was not serious but might have been very disastrous. The price of neglect is so high and the cost of prevention small.

In Fig. 1 are shown several types of brake mechanisms and the means of adjustment, if such an operation has been provided for. It will be noticed that while a few types have a means for complete adjustment of the brake band or internal shoe others are adjustable only by a change of position at the point of control of the band or shoe. There is yet another type, that which is not of itself adjustable and in which all wear is taken up by shortening the brake rods, and depending upon the equalizers to absorb any uneveness of wear. This type is shown at C where both internal and external brakes are non-adjustable. The internal brake shown at B is also included in this latter classification.

The various types of brakes here shown are not necessarily used in the above combinations as there is no reason why any of the many possible combinations should not be used. The arrangements here were made simply to show the various forms that are in general use. There are other types but the principle of adjustment is practically the same and the following advice may be easily applied.

Adjusting Foot Brake

In discussing the adjustment of brakes it may be best, for convenience, to use as an example the type A Fig 1, as this brake allows for a complete adjustment. The expression, "complete adjustment," is used because a change of position is provided for not only at the points of control but also at the anchor posts PP. The reason for this is explained later.

Assuming that the brakes are in need of a thorough adjustment, the first thing to do is to disconnect the rods from the pedal and the hand lever and allow the entire brake mechanism to release as far as is possible. In doing this it is well to see and work easily. It is a good plan to oil or grease all connection at this time, as a complete inspection will assure one that everything is in its proper working order. Jack up the rear wheel and block the front wheels.

When this has been done, loosen the nut A by turning it up until the band is about ½ inch away from the drum. Next make the adjustment for clearance at the opposite side of the brake, or at O. The brake at this point is held in place by the guide g which in turn is supported by the anchor post P. In Fig. 2, at B, is shown an en-

larged sketch of this assembly for the internal brake, but as both are the same, the method of adjustment is similar.

Remove the cotter pin cp and with a broad-faced screw driver turn the screw, a in, i. e., tighten it, until the space at O amounts to about 1/32 inch. Replace the pin and secure it in the usual manner. Now release the lock nut at B and turn the second nut away from the retaining plate M. The tension of the spring, V will take up the added distance between M and A and also lift the under half of the band. Continue to release the nut B until, by turning the wheel, it is found that there is a drag or a rubbing between the band and the drum. When this point has been reached turn the nut in the opposite direction until the wheel turns freely. This will give approximately the desired position for the lower half of the band.

Tightening Upper Half of Band

Now return to the nut A and tighten the upper half of the band using the same method to determine the proper position. It may be found that this latter operation made some slight change in the former adjustment and if this is the case turn the nut B in the required direction to bring the band in proper position. Sometimes it may be necessary to make a change at O even though one has been careful to perform each operation as complete as seems possible.

This happens when the brake has had long and hard service, resulting in an unusual amount of wear. In a case of this kind, it would be necessary to make several adjustments at each point until the desired result was obtained. Such an adjustment would give a clearance of about 1/32 of an inch at O, and this would increase gradually until at the split of the band it would be about 1/8 inch. This latter distance varies, sometimes it is less and often more than the above. The object, however, is to arrive at a point of adjustment that will allow the band to rest as close to the wheel as possible and not drag.

With the foot brake on one wheel finished, proceed to the other wheel using the same methods there to adjust that brake. When this is done connect the rod to the pedal and to do this it will be necessary to lengthen the rod. This is done by the adjustable rod end. Do not lengthen it so that the clevis pin will slip in place easily, but so it is necessary to pull on the rod with one's hand to make the holes match. This difference would amount to about ½ inch.

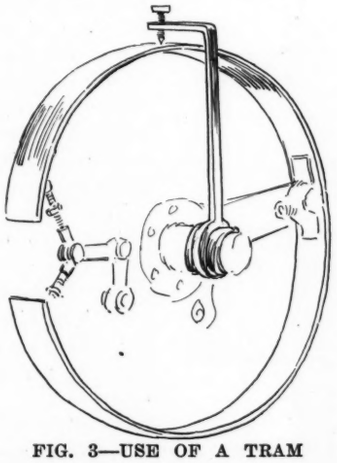


FIG. 3—USE OF A TRAM

How to adjust internal brakes when necessary to remove wheel

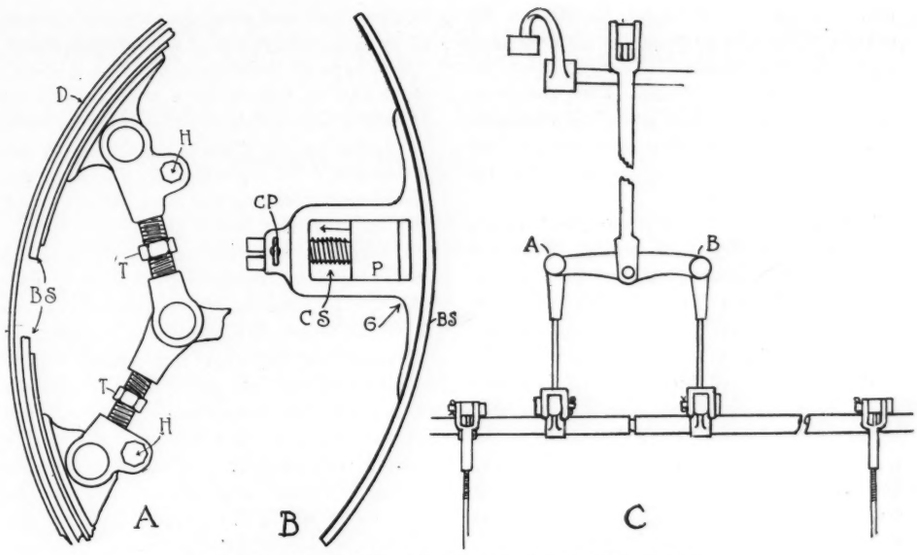


FIG. 2—ADJUSTMENTS FOR BRAKES AND RODS

A, adjustment by turnburkles. B, adjustment for clearance at O, Fig. 1. Conventional form of rod control with equalizer bar

Assuming that the rod has been connected, one person should apply the brake while another turns the wheels to determine whether both brakes are working evenly. Depress the pedal a little and hold this position until the one who is turning the wheels has had time to try both wheels. Continue this operation until it has been found that the brakes are in even adjustment or that a change is needed.

Such a change may be made by lengthening the rod leading to the brake which is the tighter of the two. At times it is found that the trouble may be materially overcome by turning the equalizer bar over so that the end formerly attached to the rod A, Fig. 2, is at B. The reason for this is that the distances between the center hole in the bar and those at the ends may be a trifle different and this would permit of an uneven pull. If such a change fails to bring about the proper remedy, or makes matters worse, replace the bar to its former position.

Adjusting Internal Brake

Adjusting the internal brake is not so easy as that of the foot, or external brake, but as this brake is so little used it does not require frequent attention. Some cars have a brake drum with a detachable plate allowing one to reach the internal adjustments without having to remove the whole wheel.

With the plate off it is possible to reach point of adjustment by turning the wheel around so that the opening in the drum is opposite the bolt or nut needing attention. In this way one may proceed with the various operations until the job is done. If it is necessary to remove the wheel the proper adjustment is obtained by using as a guide the outer edge of the circular plate that forms a guard for the protection of the brake.

The Dummy Hub

Another method is to make use of what is known as a dummy hub. This slips over the axle housing after the wheel has been removed and has a long arm extending at right angles to the axle. The end of this arm is usually bent to a right angle and a small set screw attached. See Fig. 3. The point of the screw may be set at such a position so that the distance from it to the center of the axle is equal to one-half the diameter of the inside of the brake drum. This arm or tram, may be swung around the surface of brake to determine its proper position of adjustment.

Referring to Fig. 2, at A is an enlargement of the adjustments of the toggle connections, and B shows the anchoring point of the brake shoe and also means for adjustment at this place. As with the external brake, the first operation is to adjust for the clearance space at O. The screw A passes through the guide that is attached to the brake shoe and is threaded into the anchor bar P with the large head of the screw bearing upon the guide.

Placed between the guide and the anchor bar is a small coil spring, sometimes two, that tends to push the guide and shoe away from the brake drum, or in the direction shown by the arrow. Tightening the screw compresses the spring and brings the shoe nearer the drum. The same clearance is made here as with the external brake.

When this adjustment is made, loosen the cap screws HH that serve as a locking device for the adjusting bolts T. These short stubs have a right-hand thread on

one end and a left-hand thread on the other end so that turning them shortens or lengthens the toggle, depending upon the direction they are turned. Turn the lower screw until the brake shoe has clearance between it and the drum of about $\frac{1}{16}$ inch and then adjust the upper shoe for the same distance.

The method for rod adjustment is the same as with the foot brake. Give the rods sufficient length so that it is necessary to pull the hand lever up to the fourth notch for full application of the braking power.

The adjusting of such a brake as shown at B, Fig. 1, is simple enough, but the thing to watch here is the clearance at the top. This brake is supported at the point L, either by a right-angle bar attached to the dustplate and the other end passing through a slot as shown or by such a method as at L. These supports become weak in time and need attention. If the first-named is at fault, the trouble may be remedied by increasing the angle of the supporting bar. With the other form of support a tightening of the nut just over the small spring will raise the band away from the drum.

As has been mentioned, there is no form of adjustment for a brake shown at C, Fig. 1, except the shortening of the rods. Brakes of this type usually are found on cars of light weight and consequently the amount of work performed is comparatively small.

One type of transmission brake is shown at E and as this is quite a common form of such a brake it is not necessary to dwell at length on the different methods of adjustments. This particular brake is adjusted by tightening the long butterfly nut, just as with the brake at B.

Where both the foot and hand brake are of the internal, expanding type they usually are adjustable. Two such types are shown at D and F, Fig. 1. One is expanded by means of the short adjustable toggle connections and the other with a cam arrangement, the adjustment being at the opposite side of the brake. The latter construction consists of a worm and screw at right angles and placed within the anchor bar which is designed to carry the worm and screw at the proper position. The worm usually is extended through the dust cover and in this way it is very easy to adjust. The screw is extended at top and bottom, each end entering into a swivel bar which is carried by the brake shoe. These extensions are threaded, one right and the other left, this same applying to the swivel bars.

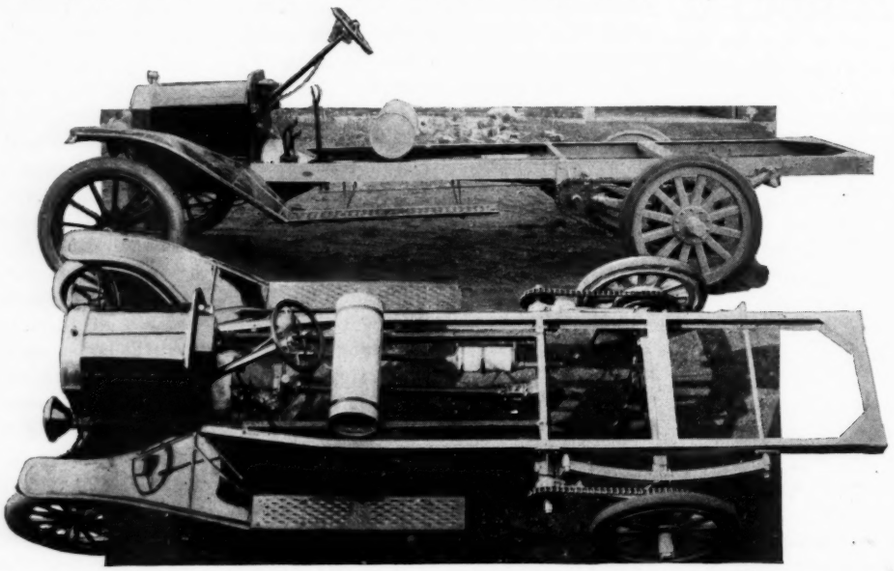
The same method is used to adjust such a brake as at D as with the internal brake A, with the exception of the clearance adjustment at O.

Attachment Makes Ford a 1-Ton Truck

Form-a-Truck Utilizes Almost Complete Chassis

TRANSFORMING the Ford chassis into a 1-ton truck is accomplished by the addition of an extension frame and rear wheels, known as the Form-a-Truck, being manufactured by the Smith Form-a-Truck Co., Chicago, a new concern organized last summer by A. D. Smith, the inventor, who is president, and E. J. Rosenfeld, the present treasurer. Since the company was organized, S. D. Porter, for 16 years with the McCormick Harvesting and Machine Co., International Harvester, and later supervisor for the United States Motor Co. and the Maxwell-Briscoe Co., joined the Form-a-Truck concern, together with Charles E. Stewart, formerly with the Michigan Buggy Co., and Stanley Twist, well known in Chicago advertising circles. Twist is the advertising manager.

The Form-a-Truck consists of a frame just enough wider at the front to fit over the chassis of the Ford at a point even with the dash. The rear wheels of the Ford are removed and the axle brought up and attached to the supplementary frame, acting as a jackshaft. Sprockets are attached to the spindles from which the Ford wheels were removed, and the drive is through heavy roller chains from these to the rear wheels.



Two views of Smith Form-a-Truck showing attachment to Ford chassis

The Ford car with the attachment has a carrying capacity of 2,000 pounds. The total frame length is 168 inches and the width, 32 inches. The axle is 2 by 1⅝ inch, mounted on roller bearings. Semi-elliptic springs are fitted, having ten leaves, the made-up spring measuring 42 by 2 inches. Wheels are of the heavy artillery type, 32 by 3½ inches. Solid Firestone tires of the pressed-on type are fitted. There are twenty teeth on the jackshaft sprocket and forty-two on the rear wheel sprocket.

Emergency brakes of the expanding type are provided on the rear wheels, operated by a hand lever. Nine feet of loading space is afforded back of the seat, the wheelbase when attached to the Ford being 125 inches. Regulation 56-inch tread is used. The weight of the attachment is 1,000 pounds, and attached to the Ford chassis, complete, 2,000 pounds.

Making of Upholstery Leather

(*Concluded from Page* 31)

is matched up like the color work on a printing press. Only a section of the hide is embossed at a time, then the hide is moved, but it is difficult to find where one impression joins with another.

With the Spanish finish, the hide with a ground color of black before the embossing of the grain, still is black and the wiping out process removes the black from the raised parts of the emboss and leaves it in the lower, so that the grain stands out more prominently, so that in the finished leather the natural brown or russet of the leather predominates.

Lastly comes the measuring machine, which is shown in the illustration at the beginning of this story. It consists of a series of rollers which pass over the hide. The upward pressure of the hide on the rollers pulls a chain that registers on the dial. Although no two hides have exactly the same outline, these small wheels transmit the area of the leather to the dial at the top of the machine. This is graduated in square feet, and the machine is so accurate that it registers very close.

Two hides are sufficient to upholster the ordinary five-passenger motor car. The hides of the best quality cost the motor car manufacturer approximately $30, the two hides measuring about 100 square feet.

Balanced Rotating-Sleeve Valve in New Tipton Motor

Inlet Through Cored Passage and Exhaust Through Central Bore in Overhead Design

THERE has not been a great deal of development during the past few months in the way of new valve designs, so far as published announcements go. Nevertheless a number of designers have been working quietly along these lines. One of these is W. P. Tipton whose design is described herewith.

It is intended to overcome inertia in the valve gear in high-speed motors by employing a rotary action. The valve design is distinctive in that it has two concentric chambers, the inner for exhaust and the outer for inlet gases.

On a 3½ by 6¾ inch motor the valve diameter will be 5 inches and the area of the valve ports will be 4.844 square feet or 50 per cent of the piston area, a ratio which is suggestive of good action at high speeds where the greatest possible volumetric efficiency and the most reasonable gas speeds are desired.

How Gas Enters

Inlet gases are led to the combustion chamber by way of the annular bridged slot shown in the middle of the valve, which slot is connected to the carbureter through the inlet manifold. This construction is clearly shown in the longitudinal and transverse valve sections in the accompanying illustrations.

Balance of the valve is secured by a second, diametrically opposed port of equal area, which distributes the gaseous pressure on either side of the valve. The passage for the gases to this balancing port is through a duct cored around the valve in the cylinder casting.

The valve surface passing the ports during the compression and expansion strokes is inclosed by four interlocking bars of cast iron lying in grooves in the valve shell and held against the valve walls by a flat steel spring in back of the bars. With a reasonable amount of lubrication it is intended that this design should assure a gas-tight fit, without reducing the clearance between the valve and the wall.

Provision is made against warping by using an outer shell of $\frac{5}{16}$-inch steel tubing into which grooves for compression rings are cut, also the teeth at the forward end of the valve for guiding purposes. The exhaust passage is of cast iron and is lightly welded at all contact points to the outer shell.

As the outer shell is partially cooled by inlet gases as well as by the water-jacketed walls, and as it is heated and cooled uniformly throughout its entire area and not locally, the designer states that uniform expansion should occur and the vastly greater strength of the outer shell will overcome the warping stresses set up in the cast-iron exhaust passages.

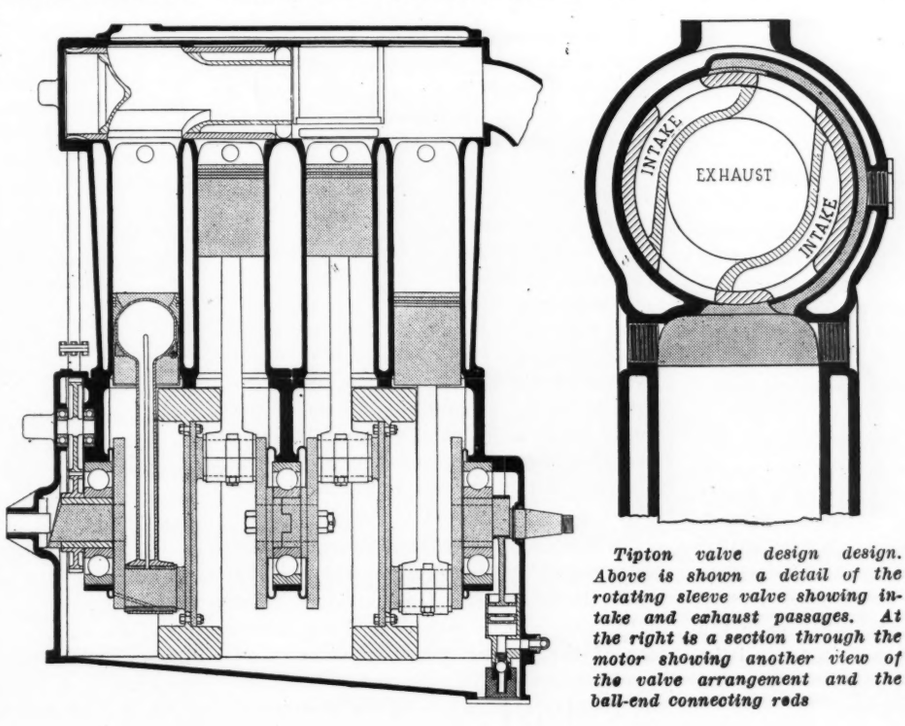
As its load is small lubrication should be simple. The designer takes care of this by a small force feed introduced at five points, one between each pair of cylinders.

Another interesting part of the design is the ball-end connecting rod. This rod is tubular, having a flare at the upper end and a hemispherical pressed steel shell welded on. The entire end is ground spherical and an adjustable aluminum alloy guide is made with compression rings. With this construction the greater part of the explosive force is accepted directly by the connecting rod and the entire construction is intended to give light weight with good thermal conditions.

It will be noted that two flywheels are used flanged to the counterbalanced crankshaft. The idea is to eliminate whipping of the shaft as the energy is stored up directly in the flywheel, without the necessity of the impulse passing through the entire shaft, thus causing a whipping action.

Lubrication is by force feed to the ball bearings, the overflow being caught by the four gutter rings and led through the drilled crank web to the connecting rod bearing, thence to the upper end of the piston through the copper tube within the rod.

A positively driven plunger pump keeps the engine base dry, forcing oil to a five-gallon tank. When the pump has cleaned out the base it draws in pure air and automatically maintains a pressure on the supply tank by means of a blow-off valve. The oil feed is connected with the throttle, thus adjusting oil supply in connection with motor speed.



Tipton valve design design. Above is shown a detail of the rotating sleeve valve showing intake and exhaust passages. At the right is a section through the motor showing another view of the valve arrangement and the ball-end connecting rods

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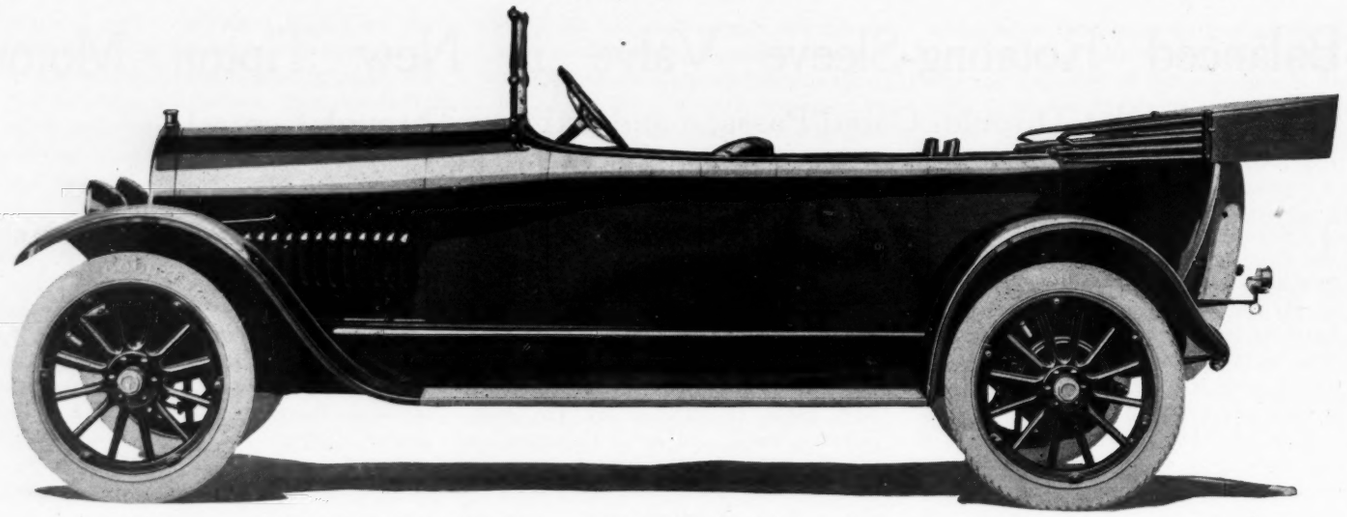
HAIL, COLUMBIA!

Detroit, Mich., Feb. 18—The new company which former President J. G. Bayerline and former Salesmanager W. L. Daly, of the King Motor Car Co., launched a few weeks ago will be known as the Columbia Motors Co.

In addition to Bayerline, who is general manager, and Daly, who is vice-president and in charge of sales, W. E. Metzger is one of the directors. Other members of the organization are: A. T. O'Connor, secretary, who was formerly with the Olds, Packard and Abbott companies; F. A. Bollinger, factory manager, who was formerly in the same capacity with the King company; Ray Lang, engineer, formerly assistant engineer of the Saxon Motor Co.; John Molerhardt, superintendent, who was formerly with the King.

It is stated that all of the capital stock has been subscribed and an option on a plant in Detroit has been secured. The first demonstrators of the new car, which is a six to sell at about $900, will be out about March first and dealers' cars are expected to be out by June first. The output for the first year will be 2,500 cars.



Side view of the new Jeffery six, which sells for $1,450 as a seven-passenger tourist

Jeffery's New Six Shows Many Refinements of Design

Up-to-Date Boat Type of Body with Rolled Edge

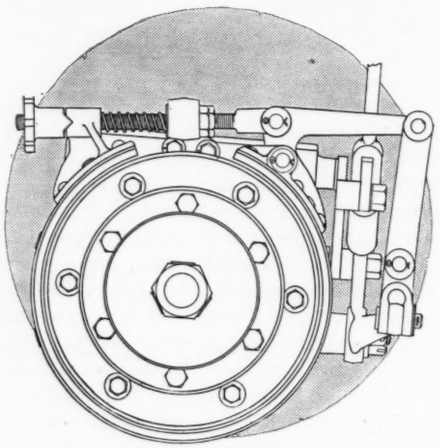
THOMAS B. JEFFERY CO., Kenosha, Wis., has recently begun delivery on a new six-cylinder car known as the model 6-61. This is more modern in design and larger in size than the Jeffery Chesterfield, the previous six, and with the Jeffery four, which has been on the market for some time, will comprise the chief unit in the Jeffery passenger car program.

The new six is to be marketed as a seven passenger tourist at $1,450. Externally it is very up to date in appearance having a much more pronounced roll inward to the sides than has been characteristic of previous Jeffery designs and with a straight line from radiator to windshield and smooth hood and cowl becomes the very latest exemplification of the marine motif in motor car superstructure.

Radiator Narrow and High

The radiator is narrow and unusually high so that it is possible to combine the modish horizontal hood line with a downward sweep to the roll edge of the passenger compartments and at the same time provide a very roomy car. With the wheelbase of 120 inches a very roomy tonneau is provided and one which is uncluttered by spare seats, for when the latter are not in use they fold forward into the backs of the forward seats.

As compared with the previous six, the new six incorporates a number of changes mechanically. In most of these a design which has been found to work out well with the four has been followed rather than that incorporated in the Chesterfield six and as the four is a much more modern model, it is to be assumed that from the standpoint of Jeffery design in general the alterations in the new six are along the lines of engineering progress.



Transmission emergency brake

In the powerplant there has been an increase in motor dimensions to 3½ by 5¼ inches which is ½ inch greater bore and a ¼ inch longer stroke than possessed by the former six and gives a piston displacement of 333 cubic inches, which is 50 per cent greater than that of the former six.

The new six, too, marks the complete conversion of the Jeffrey passenger cars to spiral-bevel drive. A design employed in the four and a departure from the practice in former six which included a worm drive in its specifications. Likewise cantilever springing which was a feature of the earlier six-cylinder car has given way to three-quarter elliptic rear suspension. In this respect the new six is similar to the four.

The braking system also incorporates a design which has proven successful in the four-cylinder car and that is the location of the emergency brake on a drum at the rear of the gearset operating directly on the drive shaft. This gives a very direct and positive application of the emergency

Transmission Emergency Brake Is a Feature of Merit

brake through short linkages and goes very far toward making an exceptionally clean looking chassis. With the connections to the service brakes carried outside of the frame and springs where they are accessible for adjustment and oiling, there is nothing left within the rear of the frame except the propeller shaft.

One of the features of the new car is the very neat arrangement of the drive to the Van Sicklen speedometer. Instead of the two pulleys and belt from the driveshaft which has been used previously, a special gear is provided which meshes with the secondary gear in the gearset. This operates the Van Sicklen drive and is completely inclosed within the gearbox where it is supplied automatically with the oil in the latter. Special attention too should be called to the unusually neat accelerator pedal, which is a rocker type and provides not only easy foot action but very simple and positive connection with the throttle.

Motor L-Head Type

To take up the mechanical design of the car in detail, we may begin with the motor, which is a block cast L-head type having both the upper and lower halves of the horizontally split crankcase made of aluminum. The valves and consequently the camshaft are on the right side and the lay shaft which drives in succession the water pump, air pump, generator and magneto is utilized along every inch of its length but without such crowding as to make any of the accessories inaccessible.

The valves have a lift of $\frac{5}{16}$ inch in the clear, the inlet being $1\frac{1}{16}$ inches in diameter and made of tungsten steel. The camshaft is a forging with the cams integral and of mushroom type. It operates

on three bearings. The valve timing of the motor is as follows:

Inlet opens 5 degrees late.

Inlet closes 45 degrees late.

Exhaust closes 5 degrees late.

Exhaust opens 55 degrees early.

Timing gears are helical with a 26-degree helix and a ten pitch. The gears all 1⅛ inches across the face, which should be sufficient to give long life before backlash or wear develops. The motor complete with its central parts, fan, carbureter, magneto, starter and generator, weighs 700 pounds according to factory specifications. The firing order of the engine is 1, 5, 3, 6, 2, 4, and a spark is supplied by a Dixie magneto.

Lubrication is a circulating system maintained by a gear pump, from an oil reservoir which is located beneath the crankcase and forced through a pipe to the top of the main bearings. From the main bearings, the oil overflows into the bottom of the crankcase into which the connecting rods dip. These pockets have overflow holes on one side which allows the oil to drain back into the reservoir beneath so that a constant level of oil is maintained at all times.

Oil Level Indicator

An indicator which shows at all times the level of the oil in the reservoir is placed beside the combination breather and filling tube. The oil pump and strainer are removable from the bottom of the crankcase for cleaning without disturbing the other parts. A separate lead to the timing gears provides a constant stream of oil from the pump for these. The circulation of cooling water is by means of a pump on the lay shaft and a two-bladed aeroplane propeller type of fan is employed.

Carburetion is by means of the new model L B Stromberg carbureter of the horizontal type bolted directly to the cylinder casting and heated by hot air drawn from around the exhaust manifold. As the exhaust header is on one side of the engine and the carbureter on the other, the hot air is taken through a pipe which goes over the top of the cylinders. Fuel feed from the rear tank is supplied by means of a Stewart vacuum gravity system.

Starting and lighting is taken care of by a Bijur generator and a Bijur motor which are separate units. A single wire or grounded system is used and the starting motor is geared to the flywheel by a sliding pinion which is shifted into mesh with the flywheel teeth when the starting switch is depressed, giving a cranking speed of 165 r. p. m. The generator is a constant-current type with a maximum output of 12 amperes. An automatic switch located inside the generator is operated by a third brush. The battery is mounted in a special cradle in the frame in such position that removal of the driver's seat cushion makes it accessible for filling. It is a 6-80 U. S. L.

Three-Plate Clutch

The clutch is a three-plate type, one steel and two asbestos plates. The gearset gives three speeds forward and is in unit with the motor, the whole power plant being suspended on three points. The gears have a ⅝-inch face and the shafts are mounted on taper roller bearings.

Hotchkiss drive is used through three-quarter elliptic rear springs. The latter are 2 inches wide and 52¾ inches long. The front springs are the same width and 36⅜ inches in length.

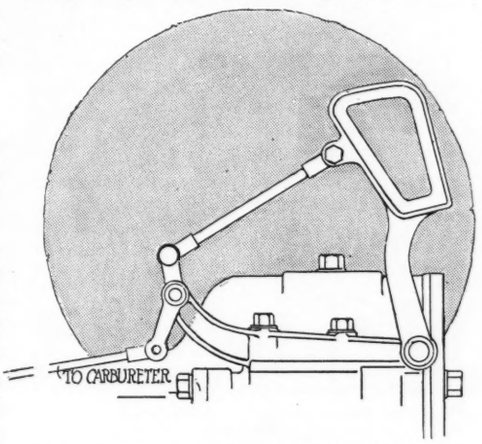
The rear axle is semi-floating, having a malleable iron center with alloy steel tubular ends. With this construction it is not necessary to use a truss rod. Removal of a large rear cover over the differential housing makes the differential readily removable and accessible for adjustment.

The frame is pressed steel and provided with four cross members which make it very rigid. The side rails are extended to the rear to provide a support for the gasoline tank and a spare tire. The spare tire carrier is a semi-circle instead of the usual complete circle and held by two quick operated hand locks, one at either end of the horizontal diameter of the tire carrier.

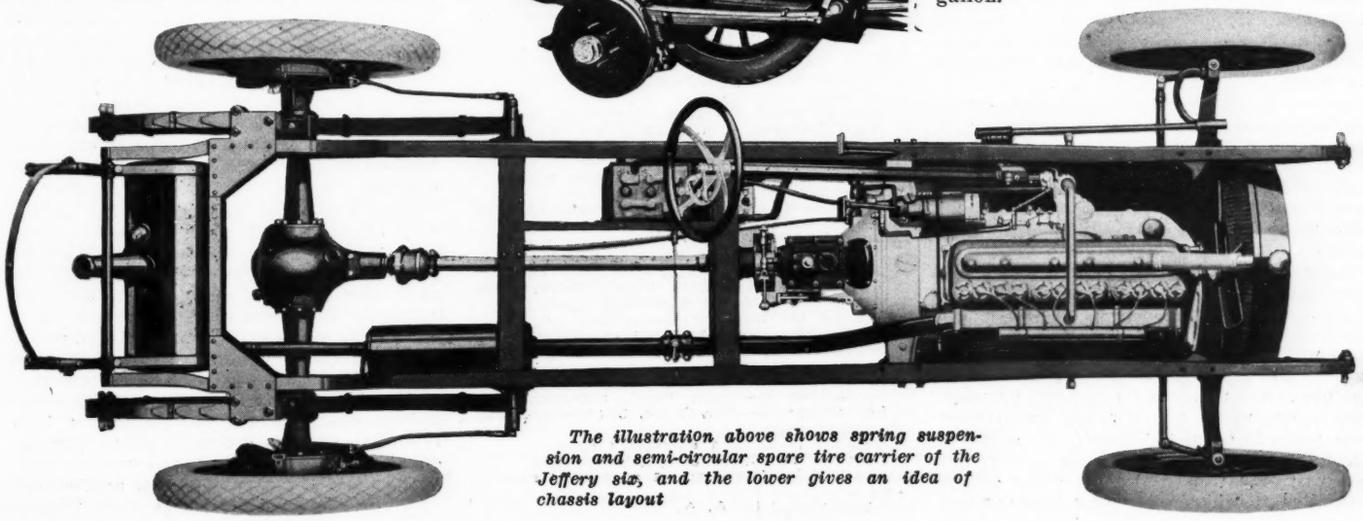
Equipment Unusually Complete

Tires are 35 by 4½ straight side on Stanwell demountable rims. The equipment is all that is to be expected of a car of this size and includes the electric lighted instrument board on which are located the Van Sicklen speedometer, electric generator indicator, oil sight feed gauge, ignition and lighting switches and fuse box. Double bulb head lamps are mounted directly on the front frame. Horn with the wiring carried through the lamp standards. The ignition switch is operated by a key in the center of the lighting switch and can be locked in any position. All the electric wiring is carried in conduits. The tire pump is a Hartford Machine Screw Co. product.

As to the actual performance of the car, factory tests have shown that the engine develops 53 horsepower at a speed of 2,000 r. p. m., although according to the N. A. C. C. formula it is rated at 29.4 horsepower at 1,000 feet per minute piston speed. Factory tests have shown a speed of 55 miles per hour with a low high gear limit of 3 miles per hour. Gasoline mileage is given at 15 to 16 and oil 300 to 400 per gallon.



Unusual type of accelerator giving direct and positive connection with throttle



The illustration above shows spring suspension and semi-circular spare tire carrier of the Jeffery six, and the lower gives an idea of chassis layout

From the Four Winds

READING Prohibits Muffler Cutouts—The Reading, Pa., council has passed an ordinance prohibiting the use of the muffler cutout on city streets and the use of glaring headlights, the penalty being from $5 to $50, or imprisonment not exceeding 30 days.

Keystone Motor Federation Annual—The annual convention of the Pennsylvania State Motor Federation will be held in Altoona, April 15. Delegations of members of motor clubs from all over the state will attend the sessions of the convention. During the stay in Altoona the visiting delegates will be entertained by the members of the Altoona Motor Club.

Car Thefts Heavy in Gotham—The New York police estimate that over $15,000 worth of motor cars were stolen in that city during the final days of the Christmas shopping. These cars probably were all supplied with locks, but to insert a key, lock the machine and remove the key at every stopping place was far too much trouble, and therefore the unfortunate consequences. A law is now said to be pending before the New York legislature to make the attachment of locks on motor cars and trucks compulsory for the sake of the safety of the general public.

Given Rainier Park Concessions—Concessions for all privileges within the Rainier National park, including transportation to the Park from Tacoma, Seattle and Ashford for a period of 20 years has been granted to the Rainier National Park Company, composed of Tacoma and Seattle business men, by the interior department. Headquarters of the new company will be in Tacoma. The company is capitalized for $200,000. All concessions within the park with the exception of the National Park Inn has been turned over to the new company. This will include the motor transportation service. T. H. Martin is secretary of the company.

Sand Boxes for Motors—Clifton Williams, an assistant city attorney of Milwaukee, Wis., has applied for patent rights on a device to prevent or minimize skidding. The appliance utilizes the principle of strewing sand on smooth surfaces to make a rough path for wheels. Like locomotives and street cars, motor cars are to be equipped with stand-boxes, from which lead pipes to a position just in front of the rear wheels. A button in reach of the driver opens a valve and sand is strewn on the ground in the path of the driven wheels. Mr. Williams intends the device to be of small and convenient size, holding just enough for one time use. He has tried out the device for a year. It is to be manufactured in large quantities as soon as preliminary details are settled.

Jitney a Premise—Although the courts decided that a jitney bus is legally to be considered a premise and can be construed as a disorderly house if any indiscretions can be proved to have taken place in the machine, Bert Aamodt, Milwaukee jitneur, was found not guilty by a municipal court jury on the charge of permitting the use of his car for immoral purposes. Aamodt was arrested last spring as the result of complaints made to the police by two girls, who claimed indiscreet actions on the part of two men while occupants of the jitney bus. Wisconsin has a stringent statute prohibiting the use of any premises for immoral purposes and it was under this law that an attempt was made to convict Aamodt. He obtained his release on a writ of habeas corpus, but the writ was vacated by the order of the circuit court, which held that a jitney or any other movable vehicle could be classed as a premise. Aamodt stood trial in municipal court and was found not guilty. The men concerned in the case were fined in district court on conviction of the charge of contributing to the delinquency of a minor.

Cincy Motorists Protest Double Tax—Coming at a time when the motorists are already up in arms over what they term unjust taxation, the suggestion of Mayor Puchta in his message to the Cincinnati, O., council that there be a city license for motor cars, has caused another one of those storms of protests. The Automobile Club of Cincinnati will fight any attempt that is made to bring about this departure. At a meeting of the club officials Harvey Meyers and Harry L. Gordon were appointed a committee to look into the matter.

Preys on Theater Motorists—An improved system of burglary has been discovered at LaCrosse, Wis., in the arrest of a youth of 20 at the request of the Minneapolis police. The alleged thief is called the "autobook artist." He equipped himself with a list of LaCrosse motorists and the license numbers of their cars, and took his stand in front of a theater. As soon as he spied a party arriving for the theater, it is alleged, he looked up the house number from the license number and proceeded to effect an entrance of the home in search of jewelry and other valuables. By the time the people returned from the play, the robber had made his getaway and covered up his tracks. The youth was caught while using his "autobook" and jotting down numbers. It is said he has operated under the same system in several large cities of the country.

30,000 Cars for North Dakota—Thirty thousand cars will be registered this year in North Dakota, if the estimate of the secretary of state is realized. Last year the receipts were $74,724 for 24,000 motor cars and of this amount the county funds received $71,434.45.

Keystone Registration Fees Gain—Up until February 9 the receipts of the motor vehicle division of the Pennsylvania highway department were $1,201,709, compared with the total receipts of 1914 of $1,184,646. The receipts this year for licenses are expected to exceed $2,000,000.

Car for Best Junior Gardener—A new 5-passenger motor car is going to stimulate thrift and industry among the 14,000 school children under 15 years of age in Oklahoma City, Okla. Mayor Overholsen has announced that he will give a car as a prize to the boy or girl under that age who produces the greatest profit next summer from gardening a vacant city lot. The commissioner of finance has agreed to present the winner a free driver's license and other citizens will see that all gasoline and repair bills are taken care of, at least for a year.

Salesmanship Congress Meets in July—It was decided the general meeting of the committees of the World's Salesmanship Congress, held in Detroit, Mich., that the dates for the next meeting will be July 9 to 13. It is to be made not only an important national affair, but even moreso from an international point of view. The position of the United States after the war will surely be such in the commercial world that preparations must be started now to meet the situation. Thus the international side of the matter of sales and salesmanship naturally must have an important part in the whole congress.

Reading Resents Riding—The motor car is very likely to be the cause of a political shakeup in Reading, Pa., unless the tactics of officials and city employes change considerably in the next few weeks. When the question of purchasing an additional motor car with $200 and the difference in the exchange of an old one came up in city council, objection was made to the promiscuous use of the city cars and gasoline by officials and employes who ride to and from their homes during the lunch hour in them. Mayor Filbert took a hand and said such luxury in the future would have to be secured from the regular jitneys. It is intimated that if the present practice continues the axe is likely to fall with serious consequences.

Georgia Counties Change Attitude—Secretary of State Phil Cook states that this year he has every reason to believe that Bibb, Chatham and Sumter counties will see to it that the registration law is enforced. Last year these counties were very indifferent and only a small proportion of the machines operated within their borders were registered and licensed by the secretary of state. Bibb county, which registered only 350 machines, already has taken out 1,015 licenses, and it is estimated that there are only about 1,500 cars in that country. During the last few days dozens of applications for licenses have been sent from Chatham

Coming Motor Events

SHOWS

February 28-March 4—Cedar Rapids, Ia., show.
February 28-March 4—Utica, N. Y., show.
February 28-March 4—Indianapolis, Ind., show.
February 29-March 4—Sioux City, Ia., show.
February 29-March 4—Fort Dodge, Ia., show.
March 4-11—Boston show.
March 8-11—Davenport-Rock Island-Moline show.
March 8-11—Mason City, Ia., show.
March 9-11—Kenosha, Wis., show.
March 15-18—Trenton, N. J., show.
March 20-25—Twin Falls, Idaho, show.
March 21-25—Deadwood, S. D., show.
March 22-25—Saginaw, Mich., show.
April 10-15—Seattle, Wash., show.

CONTESTS

May 6—Sioux City, Ia., speedway race.
May 13—New York, Sheepshead Bay speedway race.
May 20—Chicago speedway amateurs' race.
*May 30—Indianapolis speedway race.
June 10—Chicago speedway race.
June 28—Des Moines, Ia., speedway race.
July 4—Minneapolis speedway race.
July 4—Sioux City speedway race.
July 4—Track meet, Couer d'Alene, Ida.
July 15—Omaha, Neb., speedway race.
August 3-5—Hillclimb, Pike's Peak, Colo.
August 5—Tacoma speedway race.
August 18-19—Elgin road race.
September 4—Indianapolis speedway race.
September 9—Des Moines, Ia., speedway race.
September 15—Indianapolis speedway race.
September 29—Track meet, Trenton, N. J.
September 30—New York, Sheepshead Bay speedway race.
October 7—Omaha speedway race.
October 14—Chicago speedway race.
October 19—Indianapolis speedway race.

* Sanctioned by A. A. A.

county. Sumter county has been quite slow in the matter of registration, but Secretary Cook attributes this to the fact that the Sheriff of Sumter recently died, and until his successor is chosen there is no one authorized actively to enforce the law.

Missourians Getting License Tags—The new license year began with a rush at Jefferson City, Mo., February 1. During January the state registration department received applications for 29,922 licenses accompanied by checks and cash for a total of $127,068. This was an increase of 5,182 licenses and $32,194 over the total for January, 1915.

Protest Anti-Parking Plan—The Automobile Trade Association, Philadelphia, Pa., is vigorously contesting the proposed plans of Captain Mills, of the police department, to drive parked cars from the city streets. The Automobile Club of Philadelphia also has raised considerable objection, as it is contended the move would prove a serious handicap to the motor car business in the Quaker city.

License Plates Chip—Many complaints have been made by motorists recently because the new license plates issued by the motor car license bureau have chipped so easily that the enamel has fallen off. Often the letters "N. Y." have disappeared and many drivers have been summoned to appear in court because of this defect.

Good Roads Activities

Indiana County Road Expenditure—Nearly 40 miles of improved highways will be completed in Elkhart county, Ind., at a cost of almost $350,000, this year, and other petitions which are now pending action by the county commissioners may bring the total expenditure for roads up to half a million dollars.

Snag in Toll-Road Purchase—The effort of Pennsylvania to free toll roads has met with a snag in the city of Easton. The state offered $45,000 for this purpose in Lackawanna county providing an equal sum was raised there. Considerable discussion has been raised as to what should be the proportion Easton and the county should pay.

Filming Santa Fe Trail—A new motion picture producing company at Kansas City is having for its first work the filming of the Santa Fe trail, leading southwest from Kansas City to the Pacific coast. The pictures will be exhibited to arouse road-building enthusiasm along the trail and at motor gatherings. Stretches of the trail already have been taken in Kansas City and in parts of Kansas.

Good-Roads Day in Illinois—The second Friday in March has been set aside as good-roads day in Illinois. A circular containing suggestions and information of various kinds on better country roads, has been prepared by Prof. J. H. Greene, of the Illinois College of Agriculture. This circular has been sent to all county superintendents of schools in the state. They are urged to induce all teachers to take up the good-roads question among advanced pupils in order to secure their co-operation in the movement. An appropriate program is urged for good-roads day in each school.

Kansas May Change Road Laws—The next state legislature will be asked by the executive committees of the Good Roads Club of Kansas and Kansas 365-Day Road Club to enact statutes permitting two or more counties to join together in fixing road benefit district, 2, 5 or 10 miles in width. This was decided upon at a recent meeting in Topeka, called by Jasper T. Kincaid, chairman of the Good Roads Club committee, and will make it possible to form benefit districts for a cross-state highway, such as the Jefferson or the Old Trails highway, entirely across Kansas. Under the present laws one county is the limit of a benefit district.

Claim Road and Bridge Damage—Contending that the motor trucks operated by the Interurban Transportation Co., Nashville, Tenn., are doing damage to the roads and bridges of the county, several members of the Sumner county court, adjoining the county in which Nashville is located, have obtained a temporary injunction against the company. The Interurban company has its headquarters in Nashville and does a transportation business with a fleet of ten 5-ton trucks to towns in adjoining counties. It has given bond of $1,000 to cover possible damages caused by operation during the litigation.

Would Make New Road Laws—National trails once designated officially cannot be changed by individual whim if the Minnesota State Automobile association has its way. At the annual meeting February 1 a resolution was passed tc that effect, also one to make it a gross misdemeanor unlawfully too take a motor car, and to require sleds to be the same tread as motor and other vehicles. The association will work to have the state road law changed so the state will designate, build and maintain state roads, and counties shall do the same with county connecting roads. This will prevent interference in location of trail and other truck lines by county commissioners and citizens. Another desired change in the motor law is to make the maximum speed limit 32 miles.

Transcontinental Trail for Dominion?—Energetic action by the Island Automobile Club, Victoria, B. C., to prosecute its campaign in behalf of a Canadian national highway from the Atlantic to the Pacific was forecast at a recent meeting of the club, when a committee was appointed to get into touch with all other motor organizations throughout the Dominion and enlist their aid in furthering the project. A step in that direction has already been taken by the club, and the work will be carried on by the committee. Besides endeavoring to have each provincial organization work within its own jurisdiction all will be pressed to appeal to the federal government to participate in the scheme. The effort of the club to have the Dominion authorities extend the period for free entry of United States motor tourists from 10 days, as at present, to at least 3 weeks, will be continued.

Bad Roads Bar to Incorporation—Bad roads were largely responsible for the Perry county, Pa., court denying the application of the village of Loysville to be incorporated as a borough. The bad roads and poor school facilities furnish enough reason, the court decided, for denying the application. Some of the roads in that section of Perry county are nearly impassable.

Building Road in Maryland—Through a plan worked out by the farmers and residents between Doubs and Washington Junction, a road that connects Maryland with Virginia is being rapidly constructed and at a very low cost. The road runs by way of the Frederick-Point-of-Rocks pike and is a very important thoroughfare. The farmers through the section contributed liberally to the work with both finances and labor.

Lewis-Clarke Route—A movement has been launched in Missoula, Mont., for the construction of a Missoula-Lewiston, Ida., highway practically to follow the route of the Northern Pacific Railway from Missoula west to the summit of the Bitter Root mountains and thence by the middle fork of the Clearwater river to the main stream and to Lewiston. The route will have a historic interest for the reason that it follows the route of the Lewis & Clark expedition.

The Show Circuit

Brooklyn, N. Y., Show—The value of preparedness has been brought home to Brooklyn, N. Y., motor car dealers, who have been tardy in procuring space at the show to be held March 8 to 15. Space has all been sold.

Playground Is Show Site—Confederate park playground has been chosen as the site for the first motor car show ever held in Jacksonville, Fla. The dates for the show are March 6 to 11, inclusive. Henry B. Marks is managing director of the show.

Big Flag for Show—The management of the Nashville, Tenn., show has arranged for the use of the largest flag in the state of Tennessee during the show to be held in the Nashville hippodrome. It is the same flag that was used at the dedication of the New York monument at Lookout mountain recently. The hippodrome will afford space that is said to be second only to the Chicago Coliseum or the Grand Central Palace at New York.

With the Motor Clubs

Dallas Club Elect—Officers for the Dallas Automobile and Accessory Dealers Association, Dallas, Tex., have been elected for the coming year as follows: J. W. Atwood, president; W. G. Langley, vice-president; M. F. Sterrett, second vice-president; R. C. Langley, secretary and E. O. Thackston, treasurer. The following directors were elected: W. F. Gordon, R. L. Cameron and Jess Illingsworth.

Circulating Route Book Plan—The Automobile Club of Delaware County, Pa., has announced the inauguration of a new touring bureau which will be put in operation about May 15. All route sheets are to be discontinued. A member going to New England, as an example, can, upon making a deposit with the club clerk, obtain a copy of volume 2, and if returned within a certain period in good condition the deposit will be returned. The deposit is equivalent to the wholesale price of the book to members, and in the event of the book not being returned will be considered as a purchase.

East Liverpool Club Makes Progress—Good reports were made at the annual meeting of the East Liverpool Automobile Club, East Liverpool, O., held recently. Special committees on roads, bridges and legislation made reports showing the work done during the last year. Officers were elected as follows: E. L. Bradfield, president; M. G. Newman, vice-president, and S. S. Groglode, secretary-treasurer. The board of directors consists of C. A. McNichol, R. W. Harker, George McClintock, E. G. Sturgis, Frank Swaney, T. K. Moffit, L. E. Connors, Lyman Rinehart and George Lowary.

Wisconsin A. A. Elects—The Wisconsin State Automobile Association, at the annual meeting of directors, elected the following officers: President, Isaac G. Hickman, Milwaukee; first vice-president, Rudolph Hokanson, Madison; second vice-president, Dr. E. A. Taylor, Racine; secretary, Harry A. Appel, Milwaukee; treasurer, George A. West, Milwaukee. James T. Drought, founder of the association, who served as secretary and later as president for several years, declined re-election but was prevailed upon to take the post of chairman of the executive committee.

Among the Makers and Dealers

TAKING 13-Ton Girder Up Mt. Wilson—One of the toughest jobs ever undertaken by a truck tire was accomplished by Firestones when they carried steel girders—one of them weighing 13 tons—to the Carnegie Observatory on top of Mount Wilson, near Los Angeles, Cal. Five trips in all were made. The steel girders were for use in mounting the famous new telescope with 100-inch lens, the largest in the world, and which required 5 years to grind. A Saurer truck was equipped with Firestone hard-base removable tires. The conditions were: 9 miles on the mountain trail, with 1 mile rise; a grade of from 12 per cent to 20 per cent; a 6½-ton truck; a steel girder weighing 13 tons; a road bed of rough granite rock; sharp twists and turns throughout practically the entire 9 miles; all the weight on the back tires, for the front wheels lifted completely off the ground several times. The truck was equipped with 37 by 5 Firestones on front wheels and 43 by 6's dual on rear wheels. This equipment is rated by tire engineers as having carrying capacity of about 9 tons, but in this case they carried the combined weight of a 6½-ton truck and a 13-ton steel girder which, owing to the peculiar bulk of the load, rested, a dead weight, almost exclusively on the rear tires.

BUTZEL Lozier Director—H. M. Butzel, a Detroit attorney, has been elected vice-president and a director of the Lozier Motor Co.

Fisher Goes to Indianapolis—Walter M. Fisher, formerly manager of the Cadillac Co. of Illinois, has been appointed manager of the E. W. Steinhart Co., Indianapolis, Ind., state distributers for the Dodge.

Ford Plant for Calgary—The Ford Motor Co. will build an assembling plant at Calgary, Alta., next spring. The building will be four stories high, with provision made for increasing the size later. It will employ 150 men.

New Company for Cleveland-Velie—G. E. Romano, Dr. G. M. Romano and Albert Fraunfelder have formed the Cleveland-Velie Co., Cleveland, O., and opened sales rooms and service department. The new company will handle the Velie in the territory formerly covered by the Velie Motor Car Co., which now is giving exclusive attention to the Maxwell. Mr. Fraunfelder will have charge of the sales and service departments. He has been identified with the business there 12 years and more recently was in charge of the service department of the Hudson-Styvesant Co. Both Velie cars and trucks will be handled.

Coburn Maxwell Advertising Manager—Andrew E. Coburn, Detroit, Mich., former advertising manager of the Cleveland Twist Drill Co., has been appointed advertising manager of the Maxwell Motor Co.

Elliott Promoted—E. M. Elliott has been appointed general manager of the Mais Motor Truck Co., division of the Premier Motor Corp., Indianapolis, Ind. Plans have been completed to increase the production, and to add to the line of trucks hitherto manufactured.

Goddard Goes to Dodge—G. E. Goddard, who was body engineer of the Packard Motor Car Co., Detroit, Mich., has become assistant chief engineer of Dodge Bros. For the last 14 years Mr. Goddard has been connected with the engineering departments of well-known motor car manufacturing concerns. He was chief engineer for 3 years with the old Mora company, Rochester, N. Y.; during 2 years was with the Studebaker Corp. and for a little over 6 years with the Packard company, which he left, after he had been there 3 years, to join the Studebaker, later returning to the Packard company.

Tractor Company Plans Factory—The Bulkley-Rider Tractor Co., Los Angeles, Cal., has announced that as soon as a site can be decided upon, the company will begin the erection of a large factory with a capacity of twenty-five tractors per month. Plans for the factory have already been accepted and several cites are under consideration.

Jenkins Manages Detroit Willard—S. S. Jenkins, for some time manager of the Indianapolis branch of the Willard Storage Battery Co., has been appointed manager of the Detroit branch of the Willard company, vice M. G. Hillman, resigned. E. B. Reeser, formerly of the Willard company's Detroit office, succeeds to the management of the Indianapolis branch, making the second promotion Mr. Reeser has earned in less than the year he has been with Willard.

Maxwell Distributor Increases Capital—The Velie Motor Car Co., Cleveland, O., has increased its capital stock from $10,000 to $50,000. Last year the company handled both the Velie and the Maxwell cars as distributors and did about $1,000,000 business. The Velie, however, has been discontinued and the company is concentrating on the Maxwell, with the result that its orders to the factory have been about doubled. In the local territory the company has been selling cars on the payment plan.

M. A. M. Elects Members—At a meeting of the Board of Directors of the Motor and Accessory Manufacturers held in New York, the following-named concerns were duly elected to membership: Blanchard Bro. & Lane, Newark, N. J.; Flint Varnish and Color Works, Flint, Mich.; Harrison Mfg. Co., Inc., Lockport, N. Y.; Price Electric Devices Corp., Waynesboro, Va.; Syracuse Malleable Iron Works, Syracuse, N. Y., and the Walker-Weiss Axle Co., Flint, Mich., were elected to membership. The Driggs-Seabury Ordnance Co., Sharon, Pa., was reinstated to membership.

1,774 Fords Daily in January—Production during January at the Ford Motor Co., Detroit, Mich., was 44,365 cars. The average daily output, for the 25 working days was 1,774. It was the second biggest 1-month output of the company, April, 1915, holding the record, which is 46,510 cars. It would not be surprising if February will be a record-breaker, as the working force at the plant is being increased daily and production speeded. While a 1-day record of 2,100 cars was made January 28, it is reported, although not confirmed, that before the end of this month an average of 2,300 to 2,500 cars a day is to be the rule at the plant with gradual increases to 4,000 cars a day.

Million-Dollar Garage—The Western Tire and Garage Company which was recently organized at Texico, N. M., has a capital stock of $1,000,000. It began business, however, with a cash capital of $2,000. The big capitalization of the company gives it plenty of room for expansion. It is perhaps the lagest capitalized garage concern in the United States. The town of Texico is growing rapidly and the enterprising men who comprise the new company have big ideas for the future, notwithstanding the fact there is quite a long ways between the $2,000 of actual cash and the $1,000,000 of capital that the company is authorized by the state corporation commission to issue. The in-

corporators are: C. A. Robertson, N. M. Craig, B. S. Triplett, all of Texico; James D. Hamlin of Farwell, Texas; R. E. Brown, and D. L. Moye of Clovis, N. M.

Harris Plans New Plant—B. W. Harris, representing Harris Bros., Chicago, announces a $350,000 plant will be erected in the Twin Cities to make gasoline engines. The C. A. Stickney Co. plant at St. Paul recently was bought by Mr. Harris and he said either a milling concern or a motor car factory may be established there. The new plant will make gas engines of the Stickney type, will operate a repair department and manufacture several lines of machinery.

Marshall Field Adds Trucks—Marshall Field & Co., of Chicago, has added approximately $40,000 to its investment in commercial vehicles by the purchase of fifteen Packard light service motor trucks. This increases the Field fleet of Packards to forty-seven vehicles, thirty-two trucks having been purchased at various times since 1908. All these vehicles are still giving good service and it was in a great measure due to their performance over a period of years that Marshall Field & Co. decided to standardize on Packard equipment.

Packard Pays Million a Month—A million a month falls short of measuring the Packard payroll for its factory in Detroit, Mich. The amount of money put into the pay envelopes for the period from February 1 to February 15, is more than $540,000. Latest figures from the employment department show that 13,023 persons are working at the factory, and a number of these have been added since February 1. The output of the factory is 50 cars each day, and more than a score of motor trucks. This is the greatest volume of output ever made by Packard.

Canadian Plant for Chalmers—The Chalmers Motor Co. was incorporated under the laws of Canada last week with a capital of $1,000,000, as the first step toward a Canadian branch, according to C. A. Pfeffer, vice-president and assistant general manager of the company. Mr. Pfeffer declares that motor car manufacturers in the Dominion can now obtain practically everything that goes into the construction of motor cars in that country, and that the many recent advances in tariff schedules have made the exportation of motors from Detroit almost prohibitive. The former general rate was practically 33⅓ per cent. This has been increased almost 100 per cent on many articles.

To Make Light Truck—The Lane Motor Truck Co., Kalamazoo, Mich., is being organized and will be incorporated, its capital stock being $25,000. A 1,000 or 1,500 pound truck is to be placed upon the market.

Cram Goes to Overland—J. M. Cram, who was with the Mitchell-Lewis Co. for fourteen years and who was vice-president and sales manager of the L. P. C. Motor Co., also of Racine, Wis., has joined the sales department of the Willys-Overland Co., Toledo, O.

Drake to the Antipodes—Joseph R. Drake, vice-president and secretary of the Hupp Motor Car Co., Detroit, Mich., accompanied by Mrs. Drake, has started for a business and pleasure trip to Australia. Mr. Drake expects to make a study of the conditions and possibilities of the motor car business throughout the Australasian countries.

Invents New Spark Plug—A. P. Broomell, York, Pa., inventor of the Broomell vapor steam heating system and holding a number of patents, recently secured a patent on a new type of spark plug. The plug is constructed with a valve in the main stem, intended to economize the consumption of gasoline by allowing a small quantity of air to enter the cylinder head.

Shorter Hours for Studebaker—Effective March 1, 1916, the regular working hours of the South Bend plants of the Studebaker Corp. will be reduced from 55 hours per week to 50 hours per week, divided into 9 hours per days for 5 days and 5 hours on Saturdays. To adjust wages to the new working hours, all piece rates and hour rates will be increased 10 per cent. This action affects about 4,500 men and will cost the corporation about $360,000 a year.

Premier Cushion Spring Organizes—The Premier Cushion Spring company has been organized with William D. McCullough as president and general manager; W. A. Falls, vice-president and factory manager, and J. A. Schulte, secretary and treasurer. The new corporation manufactures cushion springs for motor car seats. The company is located in a plant in Detroit, Mich. The capacity at the present time is 1,000 sets of springs daily and this will be increased as the corporation has secured so many orders that the demand already exceeds the production. The company has taken its name from Premier wire, which is used in making the cushion springs.

United Plant Again Operates—After having been shutdown temporarily the plant of the United Motor Truck Co., Grand Rapids, Mich., again is in operation. The company has plenty of orders to keep it busy.

Richey Goes to Thompson—S. Hunter Richey, formerly manager of the Anderson, Ind., branch of the Russel M. Seeds Co., advertising agency, has resigned, and joined the staff of the J. Walter Thompson Co., New York.

Hipple with Mitchell—Geo. W. Hipple, recently vice-president and general manager of the Carl H. Page Motors Co., with headquarters in New York, has been secured by the Mitchell-Lewis Motor Co., to act as general merchandising counsel.

Harroun Gets Manufacturing Space—Ray Harroun, the former engineer of the Maxwell Motor Co., Detroit, Mich., has secured manufacturing space and offices in the Dodge Power building, Jefferson and Brush street, where he will start building his special racing cars and aeroplane motors.

Waterproof Windshield Solution—Dr. F. S. Harding, Los Angeles, Cal., has discovered a solution which will shed rain and fog on windshields. The name given to the solution is "Leterain," and during the recent storms the motorists of southern California have been using the fluid to great advantage.

Cline to Sun—B. J. Cline, who is conceded generally to be the oldest production man in the industry in point of service, will join the Sun Motor Car Co., Elkhart, Ind., in the capacity of factory and production manager. Mr. Cline has had an interesting career. He became identified with the industry as far back as 1898, at which time he assisted in building the first Pierce-Arrow car.

To South America for Chalmers—In order to prepare for a larger share of foreign business the Chalmers Motor Co., Detroit, Mich., has decided to send T. M. Kirker a well-known export man to South America. Mr. Kirker will visit Argentina, Chile, Brazil, Venezuela, Equador and all the other important states in Southern America; also Porto Rico, Cuba and the West Indies. He will be absent about 6 months and will investigate thoroughly the possibilities of the motor car business.

Albany, N. Y.—Richard Fitzpatrick; capital stock $5,000; incorporators, Richard Fitzpatrick, Julia B. Fitzpatrick, J. R. Fitzpatrick.

Bloomington, Ind.—Hendrix Taxi Co.; capital stock $2,000; incorporators, Clevel Hendrix, E. E. Hendrix, Samuel Pirimmer.

Brainerd, Minn.—Woodhead Motor Co.; capital stock $50,000; incorporators, J. F. Woodhead, S. D. Andrews and W. W. Eastman.

Camden, N. J.—Hadden Auto Co.; capital stock $50,000.

Canton, O.—Auto Trucking Co.; capital stock $25,000; incorporators, Gerald Heitner and others.

Cleveland, O.—Cleveland White Star Co.; capital stock $10,000; incorporators, N. C. Bailey, J. G. Brown, R. F. Limbach, E. A. Pfaff and James McFadyean.

Cleveland, O.—Luxurious Light Car Co.; capital stock $10,000; incorporators, C. H. Gale, L. Nichols, R. C. Hyatt, T. H. Jones and H. O. Jones.

Cleveland, O.—Louis Disbrow Motor Car Sales Co.; capital stock $25,000; incorporators, Louis Disbrow, M. A. Hanna, D. R. Hanna, Jr., H. W. Foster and Fred Grabien.

Cleveland, O.—Motor Mechanics Co.; capital stock $10,000; incorporators, Thomas Hallock, M. O. Hallock, E. P. Hemington, R. H. Belley, A. G. Marsh.

Cleveland, O.—H. & G. Motor Car Co.; to deal in motor cars and accessories; capital stock $10,000; incorporators, H. H. Gagelein, A. C. Honsell, A. U. Hall, W. P. Anderson, F. F. Geutset.

Clintonville, Wis.—Four-Wheel Tractor Co.; capital stock $125,000; incorporators, Levi C. Larson, Charles Topp, Charles F. Folkman, F. M. Hyde, C. B. Mayhew and John Kalmes.

Columbus, O.—Banner Tire & Supply Co.; to manufacture rubber tires and supplies; capital stock $250,000; incorporators, T. J. Mills, F. L. Woodbridge, Chas. A. Woobe, S. W. Kirts and J. O. Crawshaw.

Columbus, O.—Continental Rubber Co.; capital stock $5,000,000; incorporators, G. W. Doerzbach, J. J. Dauch, J. T. Sloat, Sidney Frohman, L. J. Weadock and Charles Sprague.

Crawfordsville, Ind.—Service Auto Co.; capital stock $10,000; incorporators, T. B. Nicholson, G. A. Long and D. A. Davis.

Cuero, Tex.—Cuero Auto Sales Co.; capital stock $5,100; incorporators, H. R. Frobrese, J. R. Frobese and C. C. Dickerson.

Dayton, O.—Importers' Rubber Co.; capital stock $5,000; incorporators, John McMillan, F. C. Hooven, G. T. Buel.

Dallas, Tex.—Willys-Overland Co.; capital stock $100,000.

Detroit, Mich.—Radford-Block Co.; to deal in motor cars; capital stock $20,000; incorporators, Harry R. Radford, William D. Block and Nellie E. Radford.

Detroit, Mich.—Roedding Signal Tail Light Co.; capital stock $10,000; incorporators, Gordon E. Roedding, Clarence E. Lehr.

Detroit, Mich.—Esco Mfg. Co.; capital stock $100,000; incorporators, E. R. Schreiter, Jr., E. M. Clasen, F. E. Humphrey.

Detroit, Mich.—Michigan Japanning & Auto Painting Co.; capital stock $3,000; incorporators, J. G. Gaunt, C. A. Owen, W. E. Hicks.

El Paso, Tex.—Red Ball Gasoline and Auto Supply Co.; capital stock $3,000; incorporators, Henry Swearengen, J. P. Shields and R. L. Holliday.

Everett, Wash.—Everett Auto Co.; capital stock $10,000; incorporators, H. W. Winde and Bertha Winde.

Houston, Tex.—Modern Tire & Repair Co.; capital stock $25,000; incorporators, F. M. Van Brunt, T. E. Armitage and E. E. Patterson.

Hamilton, Ont.—Perfection Tire & Motor Co.; capital stock $1,500,000; C. R. Cole, J. H. Christian, L. A. Rockwell.

Kalamazoo, Mich.—Motor Exchange Co.; capital stock $10,000.

Los Angeles, Cal.—J. B. Thermostat Co.; capital stock $50,000; incorporators, H. A. Wishard, C. D. Nye, H. B. Birchby, F. E. Johnston, Josephine Molty.

LaCenter, Ky.—Seatom Auto Co.; capital stock $25,000; incorporators, S. T. Payne, G. R. Seece and C. R. Quarles.

Madison, Wis.—Harry Newman; capital stock $20,000; incorporators, E. J. Malloy, J. M. Fitzpatrick and G. J. Cleary.

New York—Ward-Randall Co.; capital stock $10,000; incorporators, E. B. Ward, L. F. Randall, M. H. Randall.

New York—Sterns & Tire & Tube Co.; capital stock $500,000.

New York—Malcolm Motor Car Co.; to manufacture motor cars and trucks; capital stock $1,000,000.

Pontiac, Mich.—Michigan Drop Forge Co.; capital stock $150,000.

Racine, Wis.—Ajax Auto Parts Co.; capital stock $5,000; incorporators, T. C. Hegner, Owen McKivitt and J. J. Lochowitz.

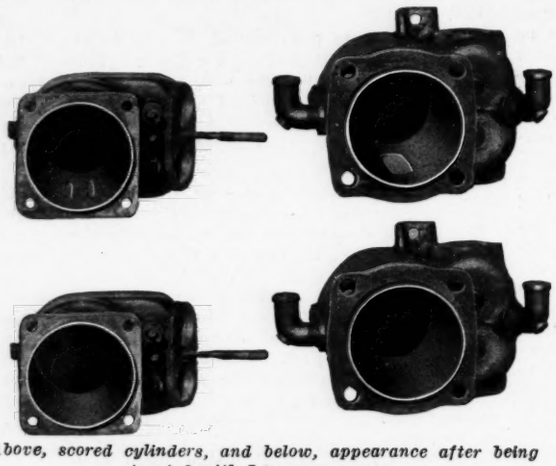
St. Louis, Mo.—Schneider-Bollman Auto Repair Co.; capital stock $1,400; incorporators, C. J. Schneider, F. O. Bollman, Henry Burg and F. W. Hoffman.

Waynesville, O.—Waynesville Auto Storage Co.; capital stock $3,500; incorporators, C. E. Thomas, H. M. Sherwood, J. B. Chapman, J. T. Ellis, C. W. Sherwood.

The Accessory Corner

Scored Cylinder Repairing

FOLLOWING the Chicago show brief mention was made of the process brought out by L. Lawrence & Co., 292 Halsey street, Newark, N. J., by which scored cylinders no longer need be reground. Since this process eliminates regrinding, it is considerably more economical than the former process together with getting new pistons and rings. The process consists of filling the shallow or deep scores with a silver composition, electrically applied, and then smoothing this down even with the face of the cylinder. The composition used has unusual heat resisting qualities and, although it is very hard when applied, it forces its way into the pores of the iron amalgamating with it and becoming a part of the cylinder. Since it expands and contracts in the same ratio as the cylinder, the tendency to loosen is overcome. During the operation of repairing scores there is not enough heat applied to warp the cylinder walls. The time for making a repair is said to be about one-half that required to rebore and fit new rings and pistons. A branch has been opened at 1522 South Michigan avenue, Chicago. Two illustrations show the same cylinders before and after being treated by this process.



Above, scored cylinders, and below, appearance after being treated with Lawrence process

Tempco Specialties

The Tempco Mfg. Co., Inc., 740 West Van Buren street, Chicago, has a line of specialties, three of which are illustrated in this department and described below. One of these is a brush for washing the car. It may be attached to any ordinary hose and it is said that a car may be washed in from 10 to 15 minutes without wetting the hands or soiling the clothes. This brush is designed to give a constant flow of clean water which keeps the brush clean at the same time the care is being washed, in other words the mud is washed off rather than being smeared over the surface of the car. The brush is made of polished aluminum with Chinese bristles. The holder has a double purpose, that of conveying water through the base of the brush and also holding a mud scraper for use in cleaning heavy mud and road tar from the underside of the menders. The washer sells for $3.50.

Another Tempco specialty is a spark plug brush and tool which consists of a steel wire brush designed to remove the carbon from the plug points, a screw driver for adjusting the points and an alligator wrench. This tool sells for 40 cents. The Tempco wire wheel washer is designed for attachment to any hose. It is made of stiff bristle on flexible, rust-proof wire and is a brush that is furnished by one of the largest wire wheel manufacturers in the country with each set of wheels it makes. Price, 75 cents.

Top, Tempco car cleaning brush; center spark plug cleaner, wrench and screwdriver; and bottom, wire wheel cleaner

Bridges Car Heater

The Home Light Co., 3353 Milwaukee avenue, Chicago, is marketing a car heater for Fords under the name of Bridges that utilizes heat obtained from the exhaust. This device consists of a heat accumulator pan resting against the exhaust pipe and the heat from this pan is conveyed through a register in the floor of the car. Installation is simple. The old floor board is removed and replaced by a board to which heater is attached. Price, $2.50.

Bales Puncture Plugger

The Bales Puncture Plugger Co., Indianapolis, Ind., makes a tire filler for injection into inner tubes which is guaranteed not to be affected in its operation by heat or cold, that it will not interfere with resiliency of the tires, injure tubes or casings, harden, gum, dry up or deteriorate with use. It is designed to stop any kind of puncture in a pneumatic tire from the smallest to the size of a twenty-penny spike. Further, the company guarantees that if by bottle-cut or accident the plugger is lost from the tube to replace it without charge any time within 6 months from date of treatment. The plugger consists of compounds of fibrous materials with sufficient liquids to keep it circulating in the tube. It occupies about 5 per cent of the space within the tube when inflated.

Makutchan Roller Bearing

The Makutchan Roller Bearing Co., 332 South Michigan avenue, Chicago, makes roller bearings under a guarantee of replacement within 2 years of date of shipment if for any reason due to defective material or workmanship they do not fulfill the purpose for which they were intended. These bearings are designed for a certain specification and when the speed, load and general application of the bearings are furnished by the buyer, the manufacturer recommends the proper bearings to be used and it is upon this condition only that the 2-year guarantee applies. They are designed for carrying loads from 1,200 up to 13,000 pounds and range in price from $8.10 for the lower weight mentioned up to $90 for the highest.

Half-Sole Tires

The International Rubber Co., Denver, Colo., is marketing a new product trademarked Half-Sole Tires. These tires are built similarly to other high-grade tires with the exception of the bead. There are from three to six plys of tire fabric, solidly vulcanized together and a thick cushion of elastic rubber which protects the fabric from breaks and ruptures. The outside thread is made up of ½-inch or more of specially compounded tough live rubber. These tires are really outer casings to go over worn tires and are said to double the mileage. They are made to fit any kind of a tire—new or old, plain or non-skid—and the rim can be of any type—clincher, Q. D., straight-side, Baker or Fisk. These tires carry a guarantee against puncture and the price is about one-half the cost of a new tire.